Service Manual

acer

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Safety Notice

Any person attempting to service this chassis must familiarize with the chassis and be aware of the necessary safety precautions to be used when serving electronic equipment containing
high voltage.

acer

Important Safety Notice

Product Announcement:

This product is certificated to meet RoHS Directive and Lead-Free produced definition. Using approved critical components only is recommended when the situation to replace defective parts. Vender assumes no liability express or implied, arising out of any unauthorized modification of design or replacing non-RoHS parts. Service providers assume all liability.

Qualified Repairability:

Proper service and repair is important to the safe, reliable operation of all series products. The service providers recommended by vender should being aware of notices listed in this service manual in order to minimize the risk of personal injury when perform service procedures. Furthermore, the possible existed improper repairing method may damage equipment or products. It is recommended that service engineers should have repairing knowledge, experience, as well as appropriate product training per new model before performing the service procedures.

NOTICE:

! To avoid electrical shocks, the products should be connect to an authorized power cord, and turn off the master power switch each time before removing the AC power cord.

! To prevent the product away from water or explosed in extremely high humility environment.

! To ensure the continued reliability of this product, use only original manufacturer's specified parts.

! To ensure following safety repairing behavior, put the replaced part on the components side of PWBA, not solder side.

! To ensure using a proper screwdriver, follow the torque and force listed in assembly and disassembly procedures to screw and unscrew screws.

! Using Lead-Free solder to well mounted the parts.

! The fusion point of Lead-Free solder requested in the degree of 220°C.

1. Product Specification

1.1 Scope:

LCD LM230WF3-S2E2

LM230WF3-S2E2 is a Color Active Matrix Liquid Crystal Display with an integral Light Emitting Diode (LED) backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally white mode. It has a 23.0 inch diagonally measured active display area with Full HD resolution (1080 vertical by 1920 horizontal pixel array) Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with

a 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16,7M colors with Advanced-FRC(Frame Rate Control). It has been designed to apply the interface method that enables low power, high speed, low EMI. FPD Link or compatible must be used as a LVDS(Low Voltage Differential Signaling) chip. It is intended to support applications where thin thickness, wide viewing angle, low power are critical factors and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LM230WF3-S2E2 characteristics provide an excellent flat panel display for office automation products such as monitors.

Active screen size	23 inches(58.42cm) diagonal
Outline Dimension	527.6 (H) x 309.7 (V) x 13.6 (D) mm(Typ.)
Pixel Pitch	0.0884*RGB(H)mm x 0.2652(V)mm
Pixel Format	1920 horiz. By 1080 vert. Pixels RGB stripes arrangement
Interface	LVDS 2Port
Color depth	16.7M colors
Luminance, white	250 cd/m2 (Center 1Point, typ)
Viewing Angle (CR>10)	R/L 178(Typ.), U/D 178(Typ.)
Power Consumption	Total 19.7 W(Typ.), (4.80 W@V_{LCD}, 14.9 W@W/O Driver)
Weight	2140 g (Typ.)
Display operating mode	Transmissive mode, Normally Black
Surface treatments	Hard coating (3H), Glare treatment of the front polarizer
Color Gamut	72%(Typ.) CIE 1931

Optical Characteristics

Ta=25 °C, V_{LCD}=5.0V, f_V=60Hz, D_{CLK}=72MHz, Is=100mA

Parameter		Symbol	Values			Units	Notes
			Min	Typ	Max		
Contrast Ratio		CR	700	1000	-		1
Surface Luminance	white	L_{WH}	200	250	-	cd/m^2	2
Luminance Variation		δ_{WHITE}	75			%	3
Response Time (Gray to Gray)		GTG	-	14	28	ms	4
Color Coordinates [CIE1931] (By PR650)	RED	Rx	Typ -0.03	0.638	Typ +0.03		
		Ry		0.334			
	GREEN	Gx		0.309			
		Gy		0.627			
	BLUE	Bx		0.153			
		By		0.073			
	WHITE	Wx		0.313			
		Wy		0.329			
Viewing Angle (CR>10)							
	x axis, right(ϕ=0°)	θr	85	89		Degree	5
	x axis, left (ϕ=180°)	θl	85	89			
	y axis, up (ϕ=90°)	θu	85	89			
	y axis, down (ϕ=270°)	θd	85	89			
Crosstalk					1.5	%	6

1.2 General Requirements:

1.2.1 Test Condition:

All tests shall be performed under the following conditions, unless otherwise specified.

Warm up time	> 30 min.
AC supply voltage	230V± 5%, 50± 3 Hz
Ambient temperature	20°C ± 5°C
Humidity	65% ± 20%
Display mode	1920 x 1080, 60 Hz, Pixel Clock：148.5MHZ,all white
e-color mode	Set to "User" mode
Contrast control	Set to The value under user mode, which allows that the brightest two of 32 linear distributed gray-scales (0～ 700mv) can be distinguished.
Color temperature	6500°K
Brightness control	The value under user mode
Analog Input signal	700 mVss
Picture position and size	Factory preset value,
Viewing angle	90 ° H and V
Viewing distance	40 cm for LCD performance, 20 cm for LCD failures
Ambient illumination	Dark room (< 1 cd/m^2)

1.2.2 Test Equipment: CHROMA 6630.

1.3 Electrical:

This section describes the electrical requirement of the monitor. Below is the block diagram.
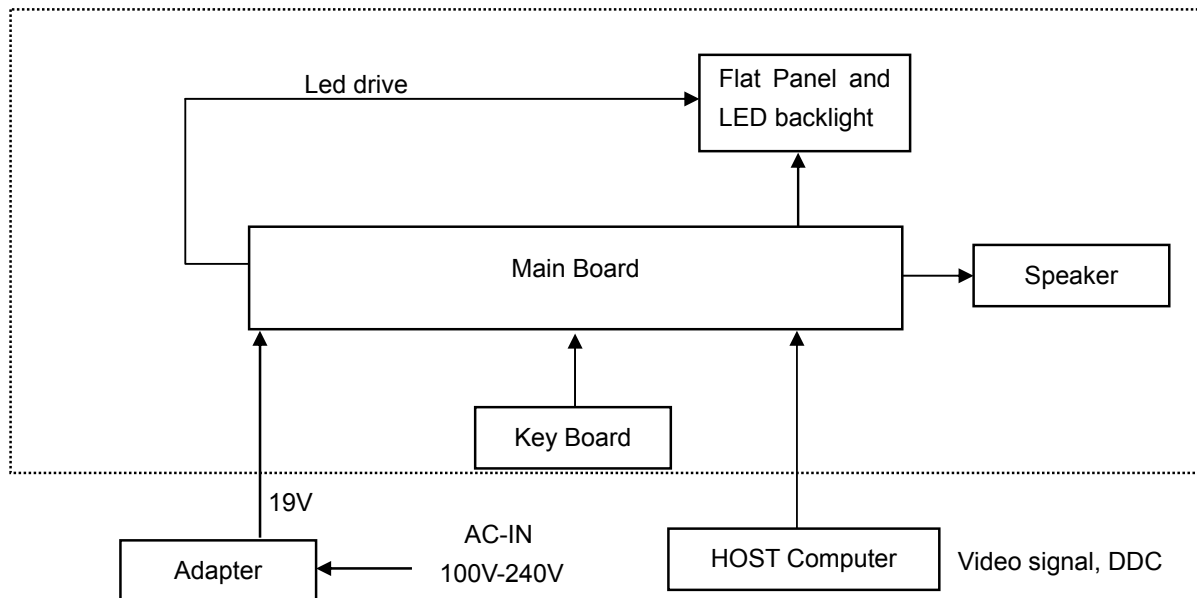
The LCD monitor will contain a main board and a key board which house the flat panel control logic, brightness control logic and DDC. The adapter will provide AC to DC voltage to drive the main board chips each voltage. The function key board is used for OSD control, monitor power ON/OFF and the LED indicator for power status.

|		
LCD Panel	Driving system	TFT Color LCD
	Pixel pitch	0.0884*RGB(H)mm x 0.2652(V)mm
	Contrast Ratio	1000(typ) /700(min)
	Response time	14ms (Typ.). 28ms(max)
	Luminance of White	250 cd/m2
Input	Separate Sync.	H/V TTL
	H-Frequency	30kHz-83kHz
	V-Frequency	56-75Hz
Viewing angle	H:178/ V:178(typ); H:170/ V:170(Min) (CR＞10)	
Display mode	1920 x 1080, 60 Hz	
EPA ENERGY STAR®	ON Mode	< 48W
	OFF Mode	< 2W
Power Source	100 V ~ 240 V, 50 ± 3Hz, 60 ± 3Hz	
Environmental Considerations	Operating Temp: 0° to 40°C Storage Temp: -20° to 60°C Operating Humidity: 15% to 90% Storage Humidity: 15% to 90% Operating Altitude: 12,000 feet Storage Altitude: 40,000 feet	
Peak surge current	< 55A peak at 240 VAC and cold starting	
Power line surge	No advance effects (no loss of information or defect) with a maximum of 1 half-wave missing per second	

1.3.1 Interface Connectors:

1.3.1.1 Power Adaptor and Connector:

The AC inlet connector shall be an IEC 320-C13 male power receptacle for connection to mains power. The power cord shall be gray or black with length of 1.5m + 10cm/-0cm. The power cord type is different from regions.The adapter output cable length of 1500±36mm,voltage is 19v and current is 2.1A.

1.3.1.2 Analog Connector and Cable: The analog signal cable shall be Gray or black and 1.5m + 10cm/-0cm.

A. D-SUB
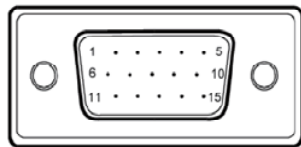
15-Pin Color Display Signal Cable

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1.	Red	9.	+5V
2.	Green	10.	Logic Ground
3.	Blue	11.	Monitor Ground
4.	Monitor Ground	12.	DDC-Serial Data
5.	DDC-return	13.	H-Sync
6.	R-Ground	14.	V-Sync
7.	G-Ground	15.	DDC-Serial Clock
8.	B-Ground		

B. DVI

24-Pin Color Display Signal Cable*

PIN	Meaning	PIN	Meaning
1.	TMDS Data2-	13.	NC
2.	TMDS Data2+	14.	+5V Power
3.	TMDS Data 2/4 Shield	15.	Logic Ground
4.	NC	16.	Hot Plug Detect
5.	NC	17.	TMDS Data0-
6.	DDC Clock	18.	TMDS Data0+
7.	DDC Data	19.	TMDS Data 0/5 Shield
8.	NC	20.	NC
9.	TMDS Data1-	21.	NC
10.	TMDS Data1+	22.	TMDS Clock Shield
11.	TMDS Data 1/3 Shield	23.	TMDS Clock+
12.	NC	24.	DDC TMDS Clock-

C. HDMI

19-Pin Color Display Signal Cable*
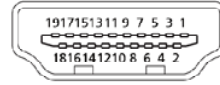
PIN	Meaning	PIN	Meaning
1.	TMDS Data2+	10.	TMDS Clock+
2.	TMDS Data2 Shield	11.	TMDS Clock Shield
3.	TMDS Data2-	12.	TMDS Clock-
4.	TMDS Data1+	13.	CEC
5.	TMDS Data1 Shield	14.	Reserved (N.C. on device)
6.	TMDS Data1-	15.	SCL
7.	TMDS Data0+	16.	SDA
8.	TMDS Data0 Shield	17.	DDC/CEC Ground
9.	TMDS Data0-	18.	+5V Power
		19.	Hot Plug Detect

D. LED backlight Connector

   Connector: CN803

Pin No.	Symbol	Description	Notes
1	FB1	Channel1 Current Feed Back	
2	FB2	Channel2 Current Feed Back	
3	NC	No connection	
4	NC	No connection	
5	VLED	LED Power Supply	
6	VLED	LED Power Supply	
7	NC	No connection	
8	NC	No connection	
9	NC	No connection	
10	FB3	Channel3 Current Feed Back	

F. Flat Panel Connector

Connector: CN406

Pin No	Symbol	Description
1	RXO0-	Minus signal of 1st channel 0 (LVDS)
2	RXO0+	Plus signal of 1st channel 0 (LVDS)
3	RXO1-	Minus signal of 1st channel 1 (LVDS)
4	RXO1+	Plus signal of 1st channel 1 (LVDS)
5	RXO2-	Minus signal of 1st channel 2 (LVDS)
6	RXO2+	Plus signal of 1st channel 2 (LVDS)
7	GND	Ground (AGP)
8	RXOC-	Minus signal of 1st clock channel (LVDS)
9	RXOC+	Plus signal of 1st clock channel (LVDS)
10	RXO3-	Minus signal of 1st channel 3 (LVDS)
11	RXO3+	Plus signal of 1st channel 3 (LVDS)
12	RXE0-	Minus signal of 2nd channel 0 (LVDS)
13	RXE0+	Plus signal of 2nd channel 0 (LVDS)
14	GND	Ground
15	RXE1-	Minus signal of 2nd channel 1 (LVDS)
16	RXE1+	Plus signal of 2nd channel 1 (LVDS)
17	GND	Ground
18	RXE2-	Minus signal of 2nd channel 2 (LVDS)
19	RXE2+	Plus signal of 2nd channel 2 (LVDS)
20	RXEC-	Minus signal of 2nd clock channel (LVDS)
21	RXEC+	Plus signal of 2nd clock channel (LVDS)
22	RXE3-	Minus signal of 2nd channel 3 (LVDS)
23	RXE3+	Plus signal of 2nd channel 3 (LVDS)
24	GND	Ground
25	SCL	SCL
26	SDA	SDA
27	PWM_OUT	Reference signal for inverter control
28	VLCD	Power Supply (5.0V)
29	VLCD	Power Supply (5.0V)
30	VLCD	Power Supply (5.0V)

1.3.2 Input Signals:

Video Input Signals Range (Analog RGB Signal)

No.	Symbol	Item	Min	Max	Uni
1	Fh	Horizontal Frequency	30	83	kH
2	Fv	Vertical Frequency	56	75	H
3	Fclk	Pixel Clock Frequency		148.5	M
4	Vih	High Level Input	2.4		V
5	Vil	Low Level Input	0	0.8	V
6	Video	RGB Analog Video Level	0	0.7	V

1.3.2.1   Video Signal Amplitudes:

The video inputs consist of Red, Green and Blue signals each has its own coaxial cable terminated at the monitor. These video signals are analog levels, where 0V corresponds to black, and 700mV is the maximum signal amplitude for the respective color. The video signal is terminated with 75 ohms.

1.3.2.2 Video Signal Termination Impedance:

The analog video signal termination shall be 75 ohm.

1.3.2.3 Synchronization (Sync) Signals:

The Horizontal Sync (HS) TTL signal is used to initiate the display of a horizontal line. HS may be either active high or active low according to the timing. The Vertical Sync (VS) TTL signal is used to initiate the display of a new frame. VS may be either active high or active low according to the timing.

1.3.2.4 Sync Signal Levels:

Level: L = 0V ~ 0.8V   H = 2.4V ~ 5V

1.3.2.5 Abnormal Signal Immunity:

The monitor shall not be damaged by improper sync timing, pulse duration, absence of sync, abnormal input signal amplitude, or any other anomalous behavior of a graphics card.

1.3.2.6 Digital TMDS Input (DVI signal input):

1.3.3 User Controls and Indicators:

Signals used for mode detection:
-Nominal horizontal frequency
-Nominal vertical frequency
-Horizontal sync. Pulse polarity
-Vertical sync. Pulse polarity
The tolerance for detecting the horizontal frequency is between ±1KHz from center frequency
The tolerance for detecting the vertical frequency is between ±0.5Hz   from center frequency

1.3.3.1 Power On/Off Switch:

The monitor shall have a power control switch visible and accessible on the front of monitor.

1.3.3.2 Power Indicator LED:

The monitor shall have LED indicators located on the front of the monitor. Table 1 is the LED color for the power indicator.

State	LED Light
ON	Blue
Power Saving Mode	Amber

1.3.3.3 On-Screen Display:

On Screen Display system shall be used to control the monitor. Current setting will be saved and OSD will be tuned off when the keys are not touched for a period of time.

A) Key Function Overview:

All functions are controlled by OSD buttons on the front of bezel.

1.Power Switch/ Power LED	To turn ON or OFF the power. Lights up to indicate the power is turned ON
2.>/(Input)	1) Activate OSD First menu when OSD is OFF 2) Press > to select the desired function. 3) Press > to change the settings of the current function. 4) When First menu is on, press >(Input) key to change source
3. .</Volume	1) Activate OSD First menu when OSD is OFF 2) Press <to select the desired function. 3) Press < to change the settings of the current function. 4) When First menu is on, press < (AUDIO) key to select audio
4. Menu/Enter	1) Activate OSD First menu when OSD is OFF 2) Activate/de-activate adjustment function when OSD is ON.
5.Auto / Exit	1) Activate OSD First menu when OSD is OFF 2) When OSD menu is in active status, this button will act as EXIT-KEY (EXIT OSD menu). 3) When exit eColor OSD, it will activate the Auto Adjustment function automatically.
6.Empowering	1) Activate OSD First menu when OSD is OFF 2) Trigger the acer eColor Management when first menu is active.

B) Menu Operation:

Pressing the MENU button brings up the first level menu.

C) OSD Function:

Acer e-Color Management
Contrast, Brightness, ACM
H-position, V-position
Clock, Focus
OSD position, Timeout
Color Select and adjust (warm, cool, user).
15 Language selected (English, Deutsch, French, Spanish, Italian, Hollands, Finnish,Turkish, Polish, Русский, Portuguese, Japanese, Chinese, Chinese Simplify, Brazilian Portuguese)
Signal Input Select and DDC/CI Control
Display Information
Factory Reset
Exit

D) OSD Control Factory Default Values:

eColor mode	Stand rd
Brightness	100
Contrast	50
ACM	Off
Color	Warm
Lan uage	English
OSD H.pos	50
OSD V.pos	50
OSD Timeout	10s
DDC/CI	On
User R/G/B	50/50/50
Volume	70

1.3.4 Monitor Modes and Timing Capability:

1.3.4.1 Format and Timing:

The monitor shall synchronize with any vertical frequency from 56 to 75 Hz, and with any horizontal frequency

from 30 to 83 KHz.

1.3.4.2 Factory Assigned Display Modes:

Mode	Resolution			
1		640x480	60	Hz
2	MAC	640x480	66.66	Hz
3	VESA	720x400	70	Hz
4	SVGA	800x600	56	Hz
5	SVGA	800x600	60	Hz
6	XGA	1024x768	60	Hz
7	XGA	1024x768	70	Hz
8	VESA	1152x864	75	Hz
9	SXGA	1280x1024	60	Hz
10	VESA	1280x720	60	Hz
11	WXGA	1280x800	60	Hz
12	WXGA+	1440x900	60	Hz
13	WSXGA+	1680x1050	60	Hz
14	UXGA	1920x1080	60	Hz

1.4   Flat Panel:

1.4.1 General Requirements:

The panel shall be a FULL HD resolution 23" diagonal TFT-LCD.

1.4.2 Polarizer Hardness:

The front polarizer should have hard coating (3H) and anti-glare treatment.

1.4.3 Backlight Requirements:

1.4.3.1 General Requirements:

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
LED String Current	Is	-	100	110	mA	1, 2, 5
LED String Voltage	Vs	46.4	49.6	52.8	V	1, 5
Power Consumption	PBar	-	14.9	15.8	Watt	1, 2, 4
LED Life Time	LED_LT	30,000	-	-	Hrs	3

1.4.4 Defects:

1.4.4.1 Defect Terminology:

Dark Spots / Lines: Spots or lines that appear dark in the display patterns and are usually the result of contamination. Defects do not vary in size or intensity (contrast) when contrast voltage is varied. Contrast variation can be achieved through the use of varying gray shade patterns.

Bright Spots / Lines: Spots or lines that appears light in the display patterns. Defects do not vary in size or

intensity (contrast) when contrast voltage is varied. Contrast variation can be achieved through the use of varying gray shade patterns.

Polarizer Scratch: When the unit lights, lines appear light (white) with display patterns dark and do not vary in size. Physical damage to the polarizer does not damage the glass.

Polarizer Dent: When the unit lights, spots appear light (white) with display patterns dark and do not vary in size. Physical damage to the polarizer does not damage the glass.

Rubbing Line: Horizontal or diagonal lines that appear gray with the display patterns dark and may have resulted from an "out of control" rubbing process on the polyimide or "waves" on the BEFs or prism sheets .

Newton Ring: The "rainbow" effect caused by non-uniform cell thickness.

Mottling: When the unit lights, variation / non - uniformity (splotch) appears light (white) with the display and might vary in size.

Dim Line: When the unit lights, line(s) in the minor (vertical) or major (horizontal) axis appear dim, but not completely on or off.

Cross Lines Off: When the unit lights , lines in both the minor and major axis do not appear.

Bright/Dark Dot: A sub - pixel (R, G, B dot) stuck off / on (electrical).

1.5 Optical Characteristics:
1.5.1 Brightness uniformity:

The brightness uniformity has to be better than 75% and is calculated according to to the following formula:

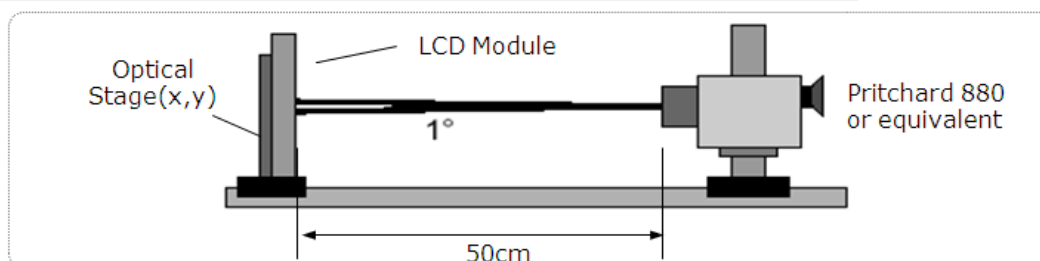$$\triangle Y = \left[\frac{YMIN}{YMAX} \right] \quad X\ 100\%$$

With Y1 to Y9 as the brightness values with all pixels white at the 9 measurement Positions. Contrast and Brightness set to Max.

1.5.2 Contrast ratio (CR):

1.5.2.1   General CR:

The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and θ equal to 0 ° .
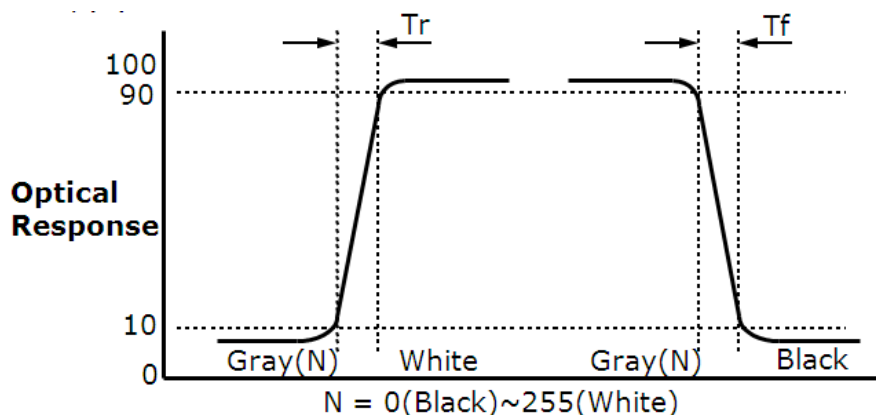
FIG. 7 Optical characteristic measurement equipment and method

Contrast ratio(CR) is defined mathematically as :It is measured at center point(1)

$$\text{Contrast ratio} = \frac{\text{Surface luminance with all white pixels}}{\text{Surface luminance with all black pixels}}$$

1.5.3 Response time:

Response time is the time required for the display to transition from black to white (Decay Time, Tr_D) and from white to black (Rise Time, Tr_R)

The sampling rate is 2,500 sample/sec. For additional information see FIG. 9.

The response time is defined as the following figure and shall be measured by switching the input signal for each gray to gray.

1.5.4 Viewing angles:
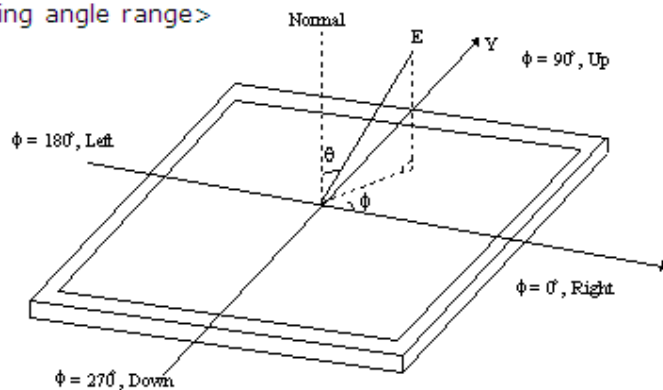
Viewing angle is the angle at which the contrast ratio is greater than 10 or 5. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG. 8.

1.6 Environmental Requirements:

	Operating	Storage
Temperature:	0°C - +40°C	-20°C - +60°C
Humidity:	15% - 90%	15% - 90%
Altitude:	12,000 feet (3,658m)	40,000 feet (12,192m)

1.7 Mechanical and Packing:

	Monitor	Packed Monitor
Width:	531.40mm	613 mm
Height:	402.21mm	118 mm
Depth:	173.44mm	413mm
Weight:	3.55KG	5.1144 KG

Dimension (mm):

ACTIVE AREA:509.18mm(L)x286.42mm(W)
Btm AA to Btm CS: 14.49mm
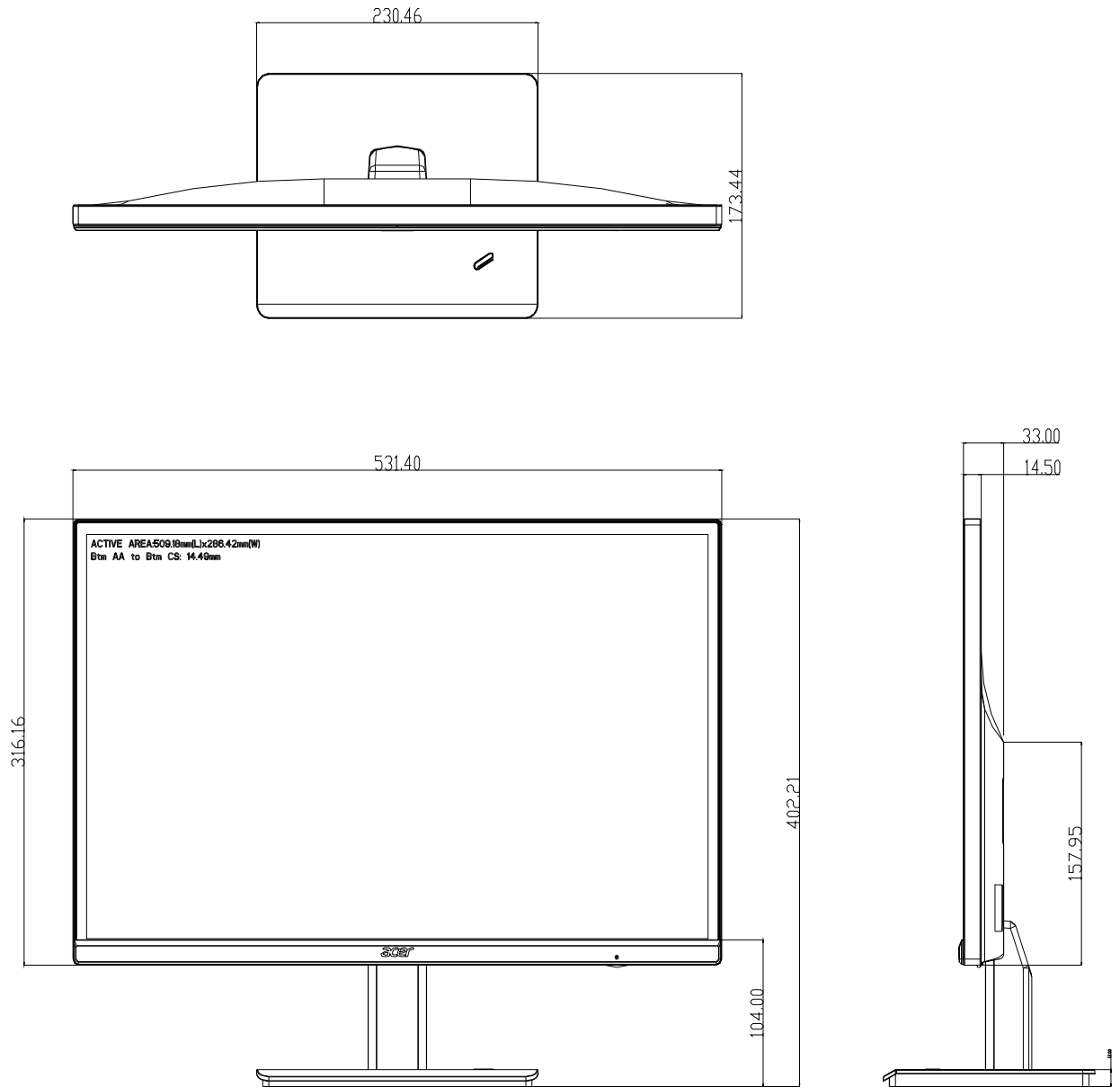
2. OSD Menu

2.1 Key Definition:

1.Power Switch/ Power LED	To turn ON or OFF the power. Lights up to indicate the power is turned ON
2.>/(Input)	1) Activate OSD First menu when OSD is OFF 2) Press > to select the desired function. 3) Press > to change the settings of the current function. 4) When First menu is on, press >(Input) key to change source
3. .</Volume	1) Activate OSD First menu when OSD is OFF 2) Press <to select the desired function. 3) Press < to change the settings of the current function. 4) When First menu is on, press < (AUDIO) key to select audio
4. Menu/Enter	1) Activate OSD First menu when OSD is OFF 2) Activate/de-activate adjustment function when OSD is ON.
5.Auto / Exit	1) Activate OSD First menu when OSD is OFF 2) When OSD menu is in active status, this button will act as EXIT-KEY (EXIT OSD menu). 3) When exit eColor OSD, it will activate the Auto Adjustment function automatically.
6.Empowering	1) Activate OSD First menu when OSD is OFF 2) Trigger the acer eColor Management when first menu is active.

2.2 Function Menu:

   1). Display Function Menu while user press any function button.

   2). Layout as following figure:

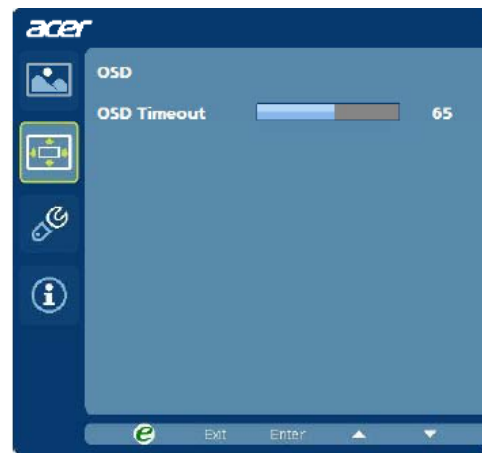2.3 Main OSD Menu:

   2.3.1. OSD layout:

   a. Display OSD menu when user press "MENU" button on front bezel.

   b. Layout as following figure.

   c. OSD layout for each function page.

Picture

OSD

Setting

Information

2.3.2 Key operation:

Key define:

Key	Function description		Key	Function description
Power	Power on/off the monitor	C	Main Menu OSD
A	Input Switch	D	Auto Config
B	Volume Management OSD	E	Trigger the acer eColor Management

OSD level 1

Press Key "C" to turn on the Menu

Key "B" → Key "B" → Key "B"

Key "A" Key "A" Key "A"

Pressing Key "D" can leave the OSD menu

Pressing Key "C" to enter items page

Pressing Key "D" to leave items page

OSD level 2

Key "A"

Key "B"

Pressing Key "C" to start adjustment

Pressing Key "B" to decrease to values
Pressing Key "A" to increase to values
Pressing Key "D" to stop adjustment
Pressing Key "C" to enter the subpage

Method 1: In OSD main menu

Key "C"

Key "C"

1. Change scenario mode, press "B" and "A".
2. Apply settings and leave the OSD by "D"

Method 1: By key "E" at Function Menu

2.4   Acer eColor management:

a. Display Acer eColor Management OSD when user press "e" button at Function menu or trigger this

function in OSD menu/picture page.

b. Layout as following figure:

2.5 OSD Message:

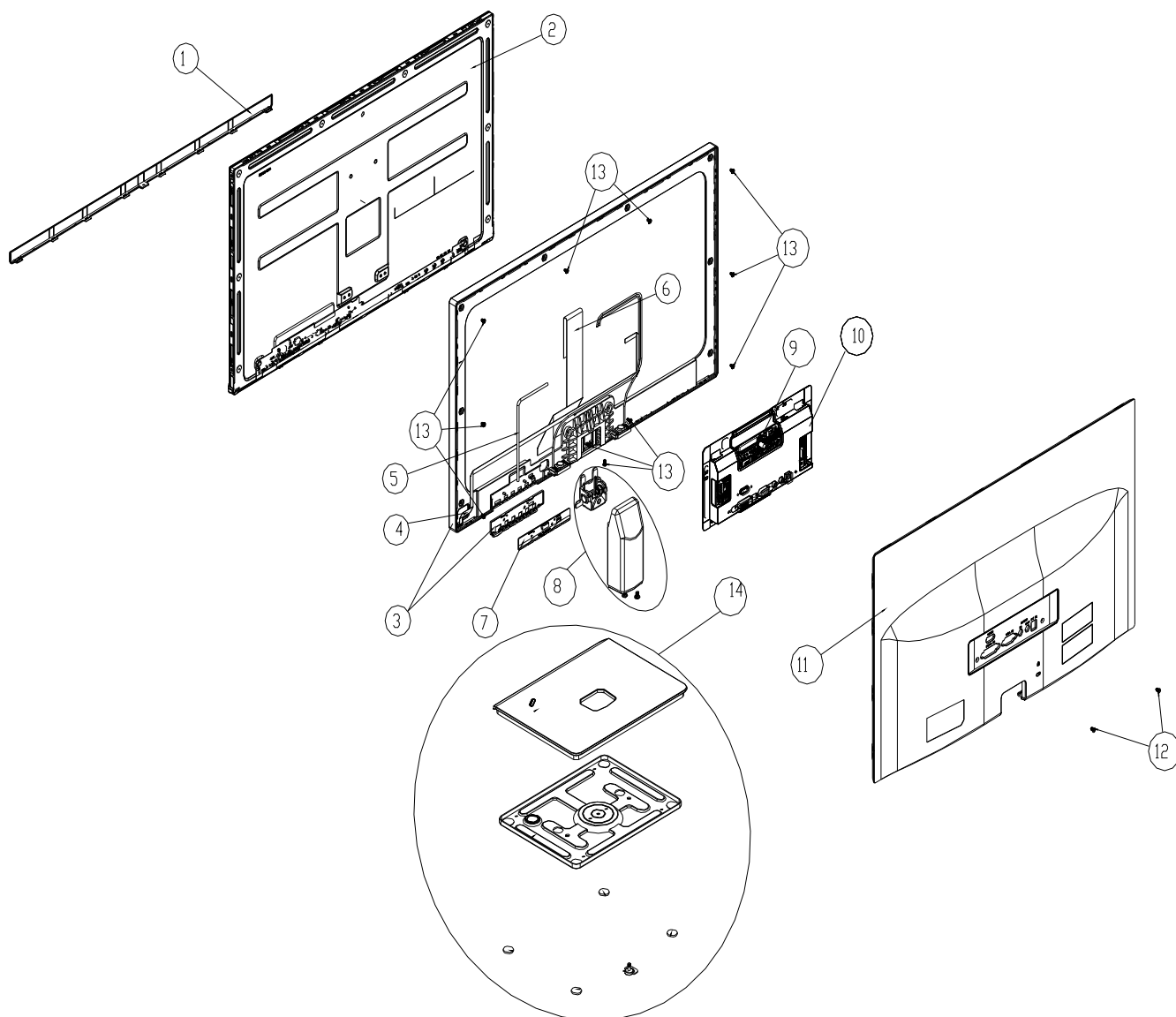| Item	Description
Auto Config Please Wait	When User Press Hot-Key "Auto", will show this message, and the monitor do the auto config function.
Input Not Supported	When the Hsync Frequency, Vsync Frequency or Resolution is out of the monitor support range, will show this message. This message will be flying.
Cable Not Connected	When the video cable is not connected, will show this message. This message will be flying with orange LED, and mute after about 60Secs.
No Signal	When the video cable is connected, but the is no active signal input, will show this message, then enter power saving.
Please Wait	After user trigger the reset function, system will show this message to notice user the reset is in proceeding

3. Exploded Diagram

3.1 Product Exploded Diagram:

Note: The parts information listed below are for reference only, and are subject to change without notice.

H236HL

Item	Description	LNT Part No.	Acer Part No.
1	bezel	A34G3021AEM-1B0100	42.LX1M2.001
2	PANEL LM230WF3-S2E2	750GMT230W3E21N100	KL.2300W.002
3	mid-frame ASSEMBLY	705GFACS307	60.LX1M2.005
4	FFC CABLE 10PIN 553MM P0.5MM HONGLIN(main board o backlight)	F95G176H-10358	50.LX1M2.001
5	WIRE HARNESS 6P-6P 200mm XINYA(main board to key board)	F95G8014-6X140	50.LX1M2.003
6	FFC CABLE 30PIN 299MM P1.0MM KOTL(main board to panel)	F95G179J30N259	50.LX1M2.002
7	KEYPAD BOARD	KEPCCQYO	55.LX1M2.002
8	STAND ASSY	705GFACS308	60.LX1M2.002
9	CONVERSION G5757-M0B-000-0040-2-120717	CBPCCT7ABQD	55.LX1M2.001
10	Mainframe	A15G1793201	33.D2GM2.001
11	rearcover	A34G3022AEMA3B0100	60.LX1M2.001
12	SCREW	0M1G3030--6-47-CR3	N/A
13	SCREW	0M1G3030--4-47-CR3	N/A
14	STAND ASSY	705GFACS308	60.LX1M2.002

3.2 Packing Exploded Diagram:
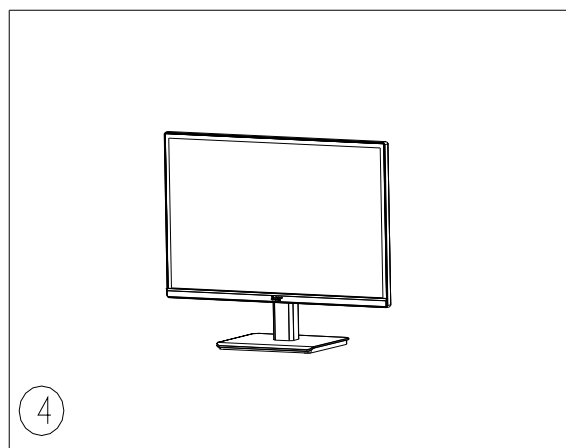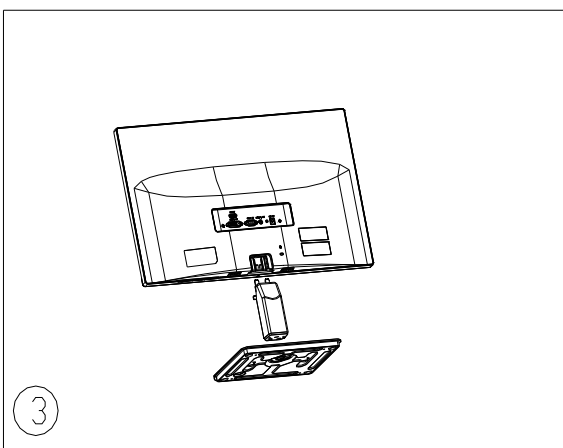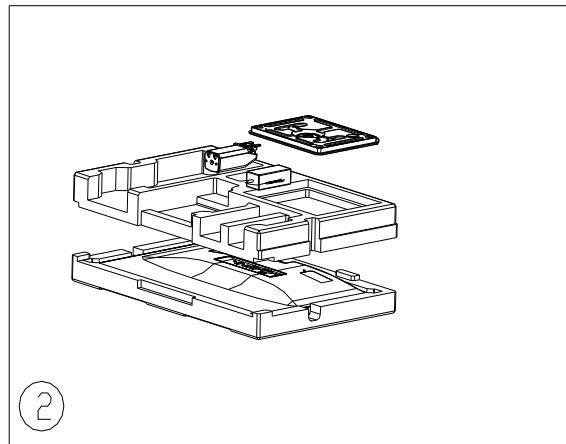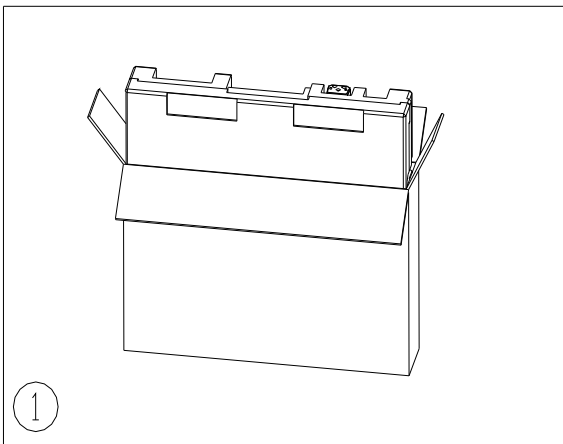
4. Assembly and Disassembly Procedures

4.1 Assembly Procedures:

S1 Prepare a main board, a mian frame. Assemble every part as the below picture.
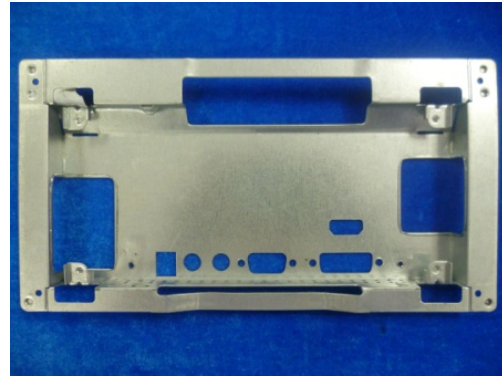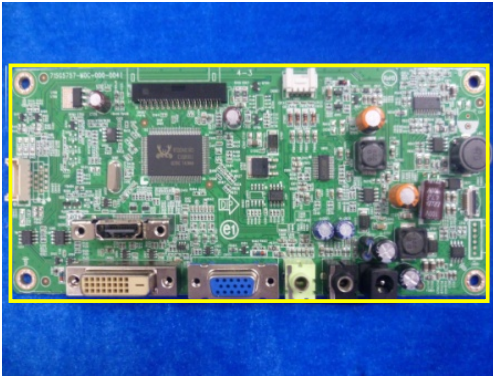
① Turn over the main board and Lock screws.	②Turn over the main board and lock the four screws.
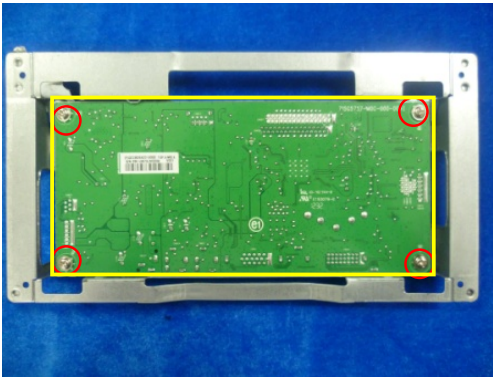
S2   Prepare a bezel, a panel and middle frame assy

① Assemble the bezel and panel.	② Insert the FFC cable lower left the panel, then stick the yellow tape as follow
③ Put the middle frame assy in front of the panel and insert the LVDS cable lower the panel	④ Lock the nine screws in front of the middle frame
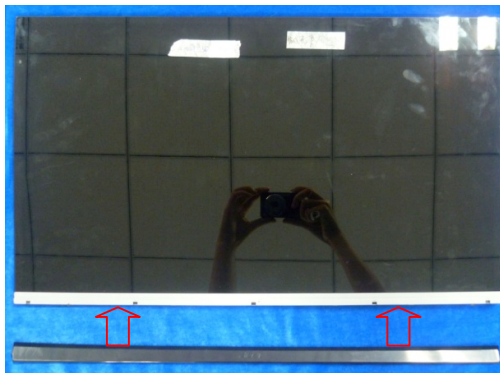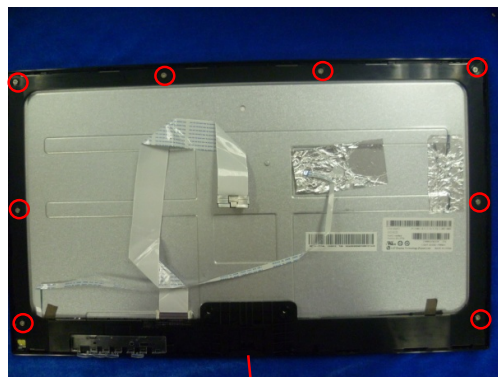
S3 Connect FFC cable and fix Mainboard:

① Put the Key board in front of the key and connect the FFC cable	② Connect all kind of cables as follow
	Connect to Speaker Speaker
Marked 22 and 23	③ Put the mainframe along the mark Align to 23 Align to 3
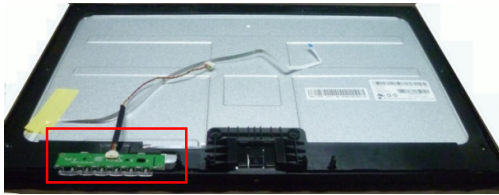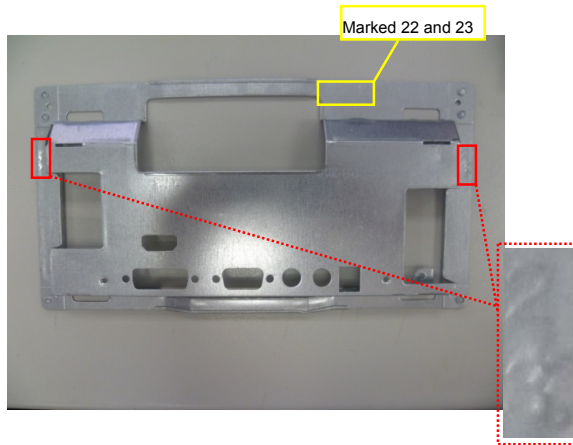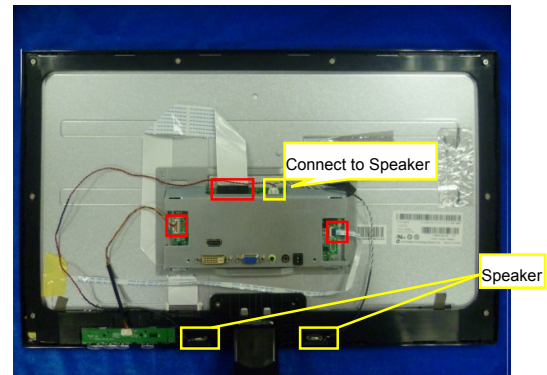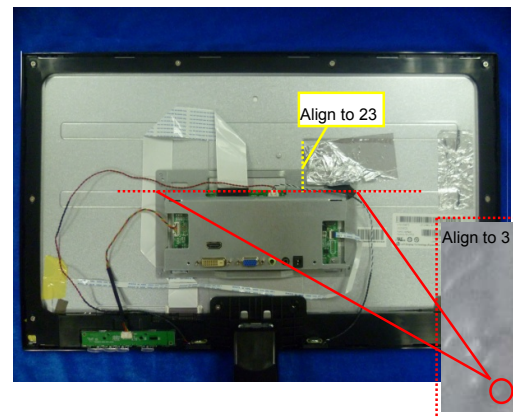
S4 Assemble rear cover and lock the two screws.

S5 Prepare a Stand, a Hinge and a Base

① Put the hinge into the slot	Base assy
	Assemble the stand ass'y and the base
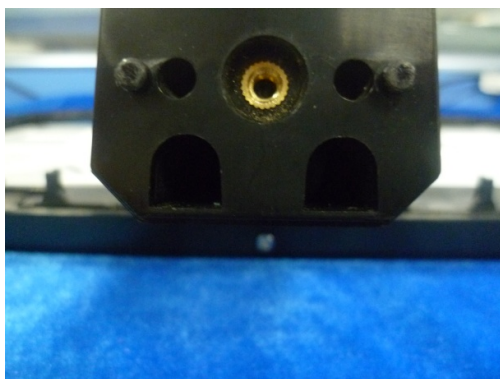
4.2 Disassembly procedures:

S1 Put the monitor on a protective cushion.

① Unscrew the screw as the below picture	② Pull out the stand ass'y.
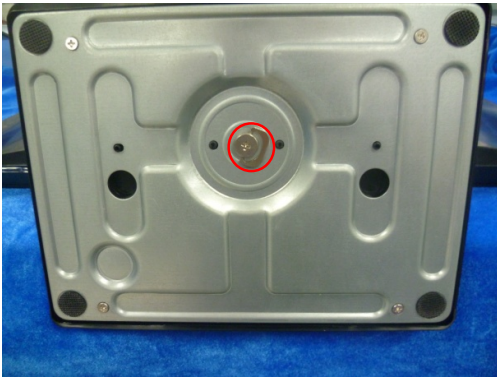
S2 Unscrew the two screws and then open all latches with tool.

S3 Remove the rear cover.

S4   Tear out all tapes on the main frame,and romove the main frame,key board and the speaker.
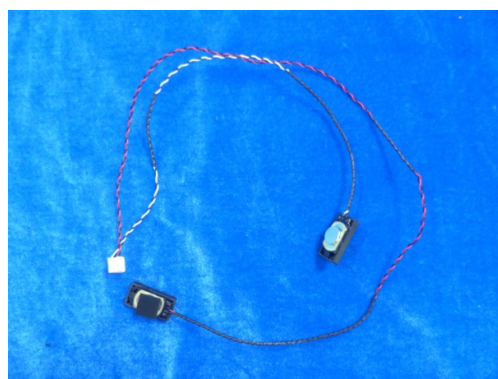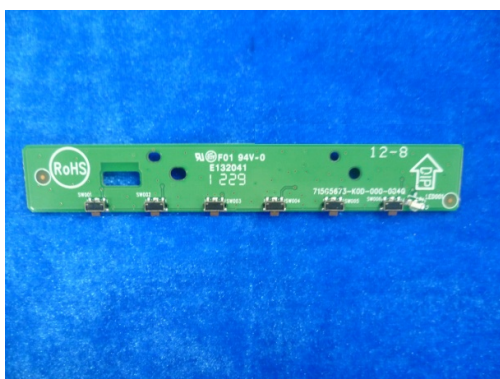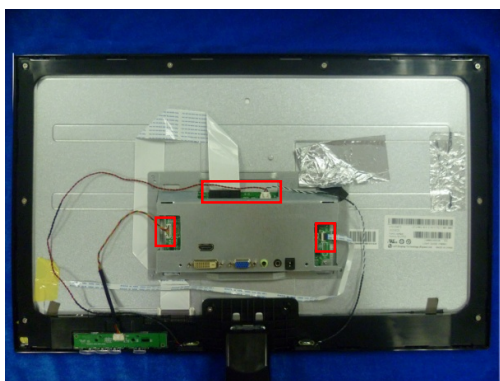
S5 Remove out the panel、bezel、middle frame.

①Uscrew the nine screws in front of the middle frame	② Disconnect two cables
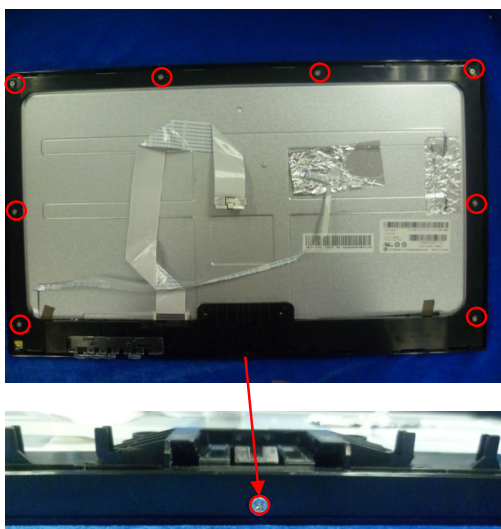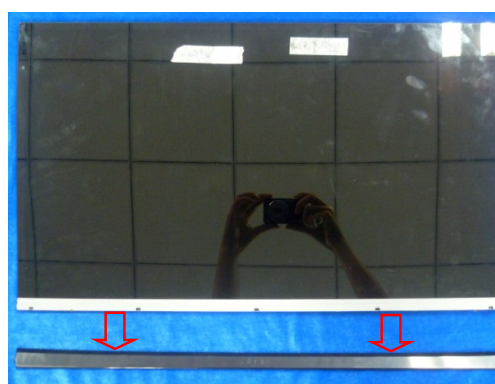
S6   Separate the main board and I/O Bracket.

① Turn over the main board and unscrew the four screws.	②Turn over the main board and unscrew the two screws.
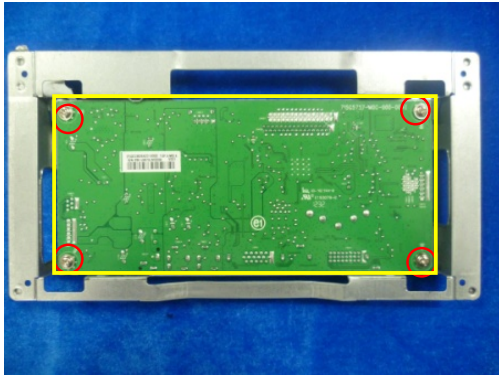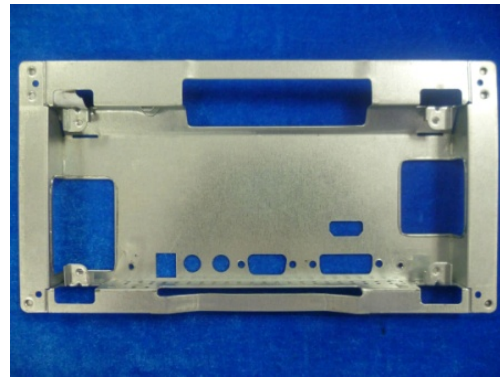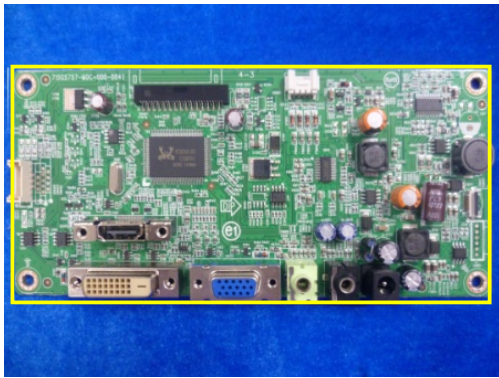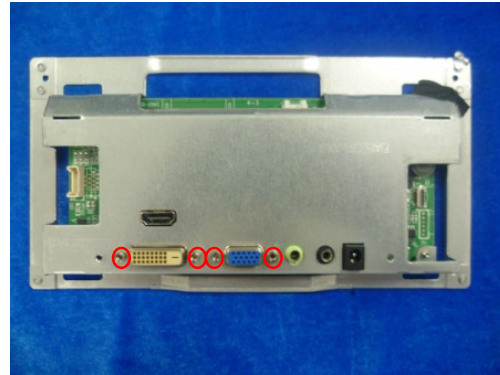
NOTE: Circuit boards >10 cm² has been highlighted with the yellow rectangle as above image shows. Please detach the Circuit boards and follow local regulations for disposal.

5. Troubleshooting

1. No Power

```
                        ┌─────────────────┐
                        │    No power     │
                        └─────────────────┘
                                 │
                                 ▼
                    ╱─────────────────────╲
                   ╱  Check power cable is  ╲        NG      ┌──────────────────────────┐
                  ⟨  tightened or adapter is  ⟩ ──────────→ │ Re-plug the power cable or │
                   ╲         ok?            ╱                │   replace the adapter     │
                    ╲─────────────────────╱                 └──────────────────────────┘
                             │ OK
                             ▼
                    ╱─────────────────────╲        NG
                   ╱  Check Power "On/Off"  ╲              ┌──────────────────────────────┐
                  ⟨      is "On"?            ⟩ ──────────→ │ Turn on the Power "On/Off" switch │
                   ╲─────────────────────╱                └──────────────────────────────┘
                             │ OK
                             ▼
                    ╱─────────────────────╲        NG
                   ╱    Check the LED        ╲            ┌──────────────────────┐
                  ⟨    indicate is OK?        ⟩ ────────→ │  Check the AC power  │
                   ╲─────────────────────╱               └──────────────────────┘
                             │ OK
                             ▼
        ┌──────────────────────────────────────────────┐
        │  Replace the power board and check connections │
        └──────────────────────────────────────────────┘
                             │ NG
                             ▼
        ┌──────────────────────────────────────────────┐
        │   Replace main board and check connections    │
        └──────────────────────────────────────────────┘
                             │ NG
                             ▼
        ┌──────────────────────────────────────────────┐
        │   Replace key board and check connections     │
        └──────────────────────────────────────────────┘
```

2. No Video (Power LED Blue)

```
┌─────────────────────────┐
│ No Video (Power LED Blue)│
└─────────────────────────┘
            │
            ▼
         ◇ Press the power        NG
           button is OK?   ─────────────►  ┌──────────────────────┐
                                           │ Replace the main board│
            │ OK                           └──────────────────────┘
            ▼
         ◇ Check the main board   NG
           and connection  ─────────────►  ┌──────────────────────┐
                                           │   Re-plug the cable   │
            │ OK                           └──────────────────────┘
            ▼
         ◇ Check the LVDS/FFC     OK
           cable or panel  ─────────────►  ┌──────────────────────┐
                                           │ Replace the LVDS/FFC  │
            │ NG                           │   cable or panel      │
            ▼                              └──────────────────────┘
┌──────────────────────┐
│ Replace the key board │
└──────────────────────┘
```

3. DIM

```
                    ┌─────────────────────────────────────┐
                    │  DIM (image overlap, focus or flicker) │
                    └─────────────────────────────────────┘
                                      │
                                      ▼
                              ╱─────────────╲                 OK      ┌──────────┐
                             ╱  Reset in      ╲───────────────────────▶│ The end  │
                             ╲  factory mode  ╱                        └──────────┘
                              ╲─────────────╱
                                    │ NG
                                    ▼
                              ╱─────────────╲
                             ╱ Set to the     ╲               OK       ┌──────────┐
                            ╱ optimal          ╲──────────────────────▶│ The end  │
                            ╲ frequency, select ╱                      └──────────┘
                             ╲ the recommended ╱
                              ╲  frequency    ╱
                                    │ NG
                                    ▼
                              ╱─────────────╲
                             ╱ Readjust the   ╲              OK        ┌──────────┐
                            ╱ phase and pixel  ╲─────────────────────▶ │ The end  │
                            ╲ clock in the     ╱                       └──────────┘
                             ╲ user mode      ╱
                              ╲─────────────╱
                                    │ NG
                                    ▼
                              ╱─────────────╲
                             ╱ Pull out signal ╲            OK    ┌──────────────────────┐
                            ╱ cable and check   ╲────────────────▶│ Check the signal cable│
                            ╲ "Self Test Feature╱                 │ and the PC           │
                             ╲ Check" is ok?   ╱                  └──────────────────────┘
                              ╲─────────────╱                              │ NG
                                    │ NG ◀─────────────────────────────────┘
                                    ▼
                              ╱─────────────╲                 OK      ┌──────────┐
                             ╱ Replace the    ╲───────────────────────▶│ The end  │
                             ╲ main board     ╱                        └──────────┘
                              ╲─────────────╱
                                    │ NG
                                    ▼
                            ┌─────────────────┐
                            │ Replace the panel │
                            └─────────────────┘
                                    │
                                    ▼
                            ┌─────────────────┐
                            │       OK        │
                            └─────────────────┘
```

4. Color is not optimal

```
                          ┌─────────────────────┐
                          │  Color is not optimal │
                          └─────────────────────┘
                 ┌──────────────────┴──────────────────┐
                 ▼                                      ▼
          ┌────────────┐                        ┌──────────────┐
          │ Miss color │                        │  Color shift │
          └────────────┘                        └──────────────┘
                 │                                      ▼
                 ▼                            ┌────────────────────────┐
          ◇ Replace the signal cable ◇        │  Reset the factory mode │
                 │              │ OK           └────────────────────────┘
            NG   │              ▼                         │ NG
                 ▼        ┌───────────┐         ┌──────────────────────────┐
          ◇ Pull out the │ The end   │         │ In the user mode, set the"│
            signal cable └───────────┘         │ color settings" until     │
            and check the                      │ customer satisfy          │
            screen color                       └──────────────────────────┘
            display is                                    │ NG
            normal? ◇
                 │         │ OK
            NG   │         ▼
                 │   ┌────────────────────────────┐
                 ▼   │ Replace the signal cable or PC│
          ┌──────────────────────┐
          │ Replace the main board │ ◄───────────────┘
          └──────────────────────┘
```

6. Firmware Upgrade Process

The SOP as below apply to the model H236HL

6.1   Materials list
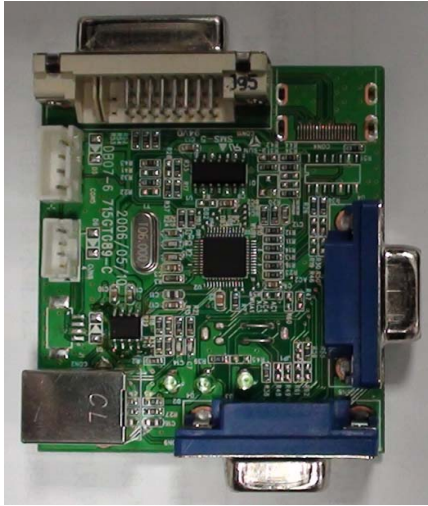
ISP JIG: 715GT089-B/C

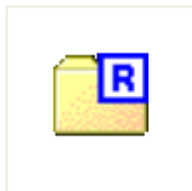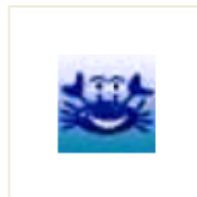VGA cable

TPV P/N: 089G728 GAA DB

PC
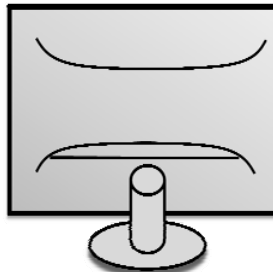
Monitor

USB cable

TPV P/N: 089G1758 X

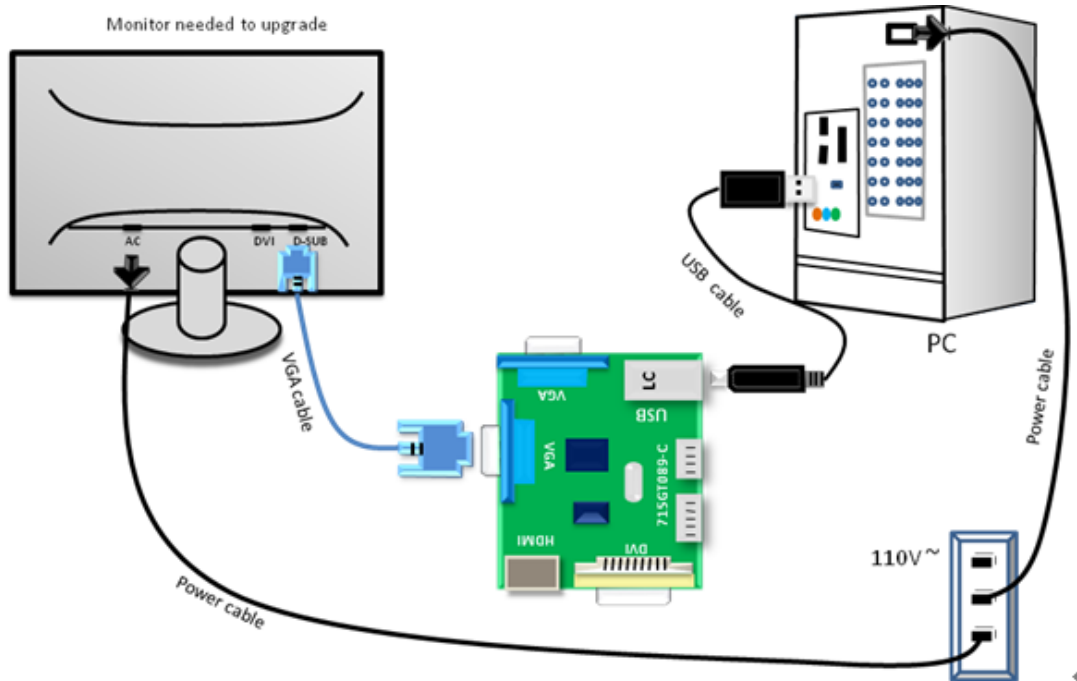FTC100103(MSTAR) usb
drive.rar

USB port driver

RTD Customer Tool

ISP tool: V1.7 Beta2

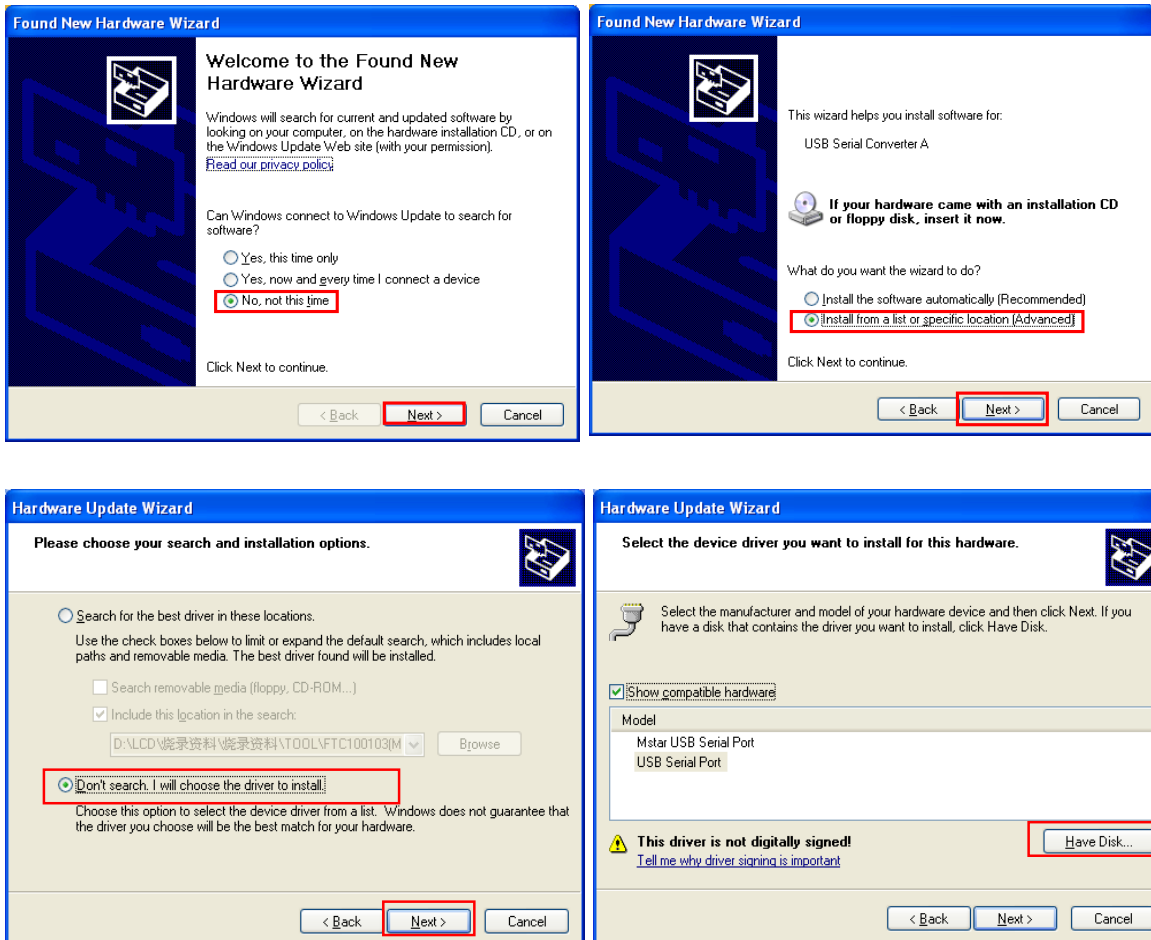
ACER_H236HL_RTD2483R
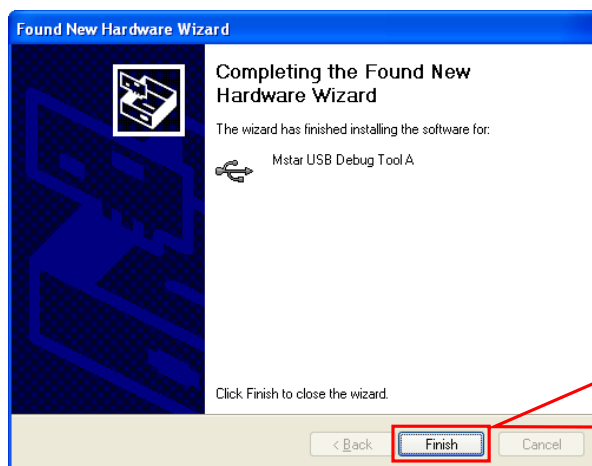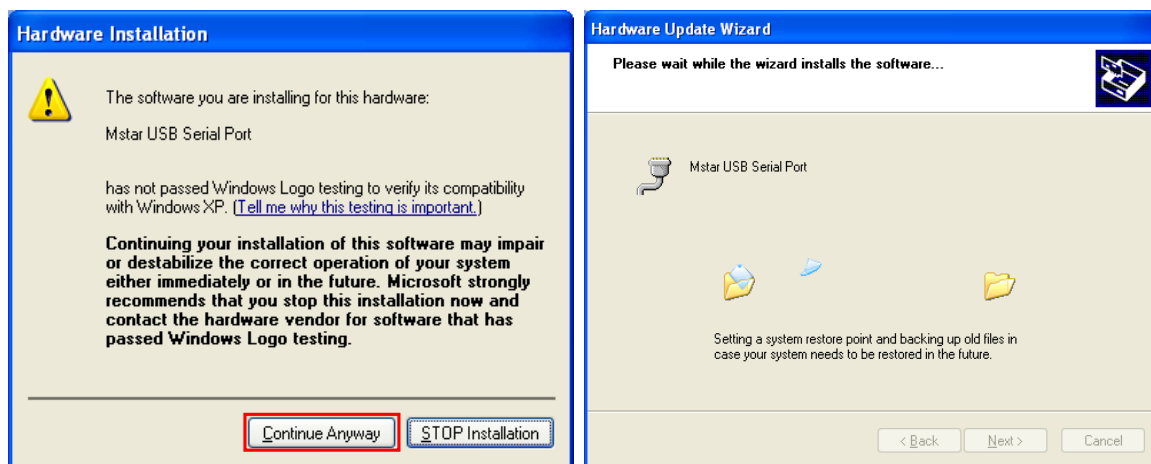D_BM230WF5_HEV_12090
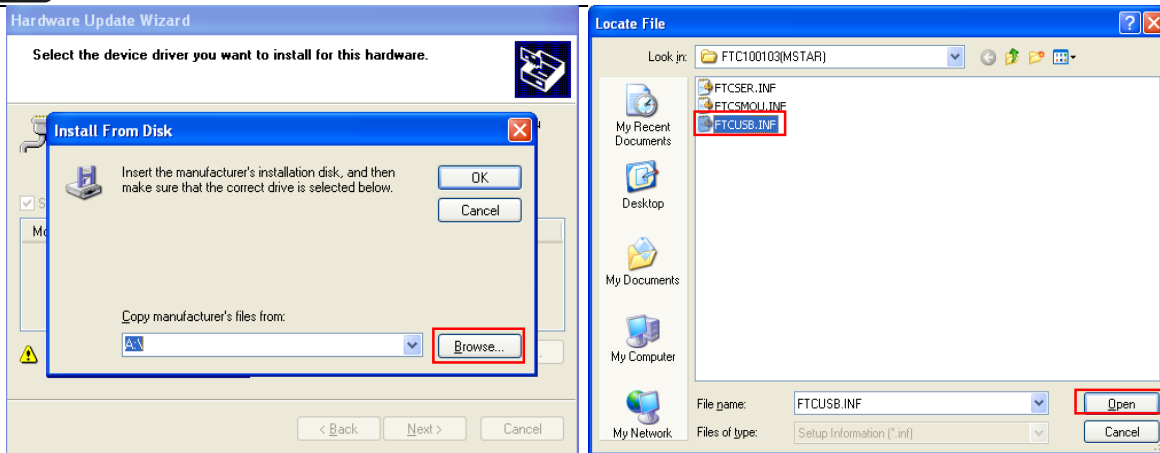6_V003

New F/W

6.2 Connection

6.3 Install USB driver.

6.3.1   When insert the USB cable to PC USB port, will pop up a Hardware Wizard to help you install the USB driver if you use this ISP board first time. You can install it successfully as the below instruction step by step.

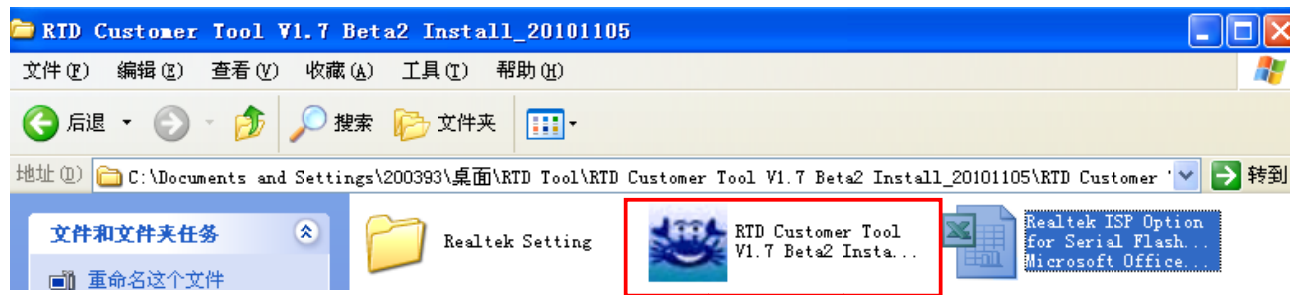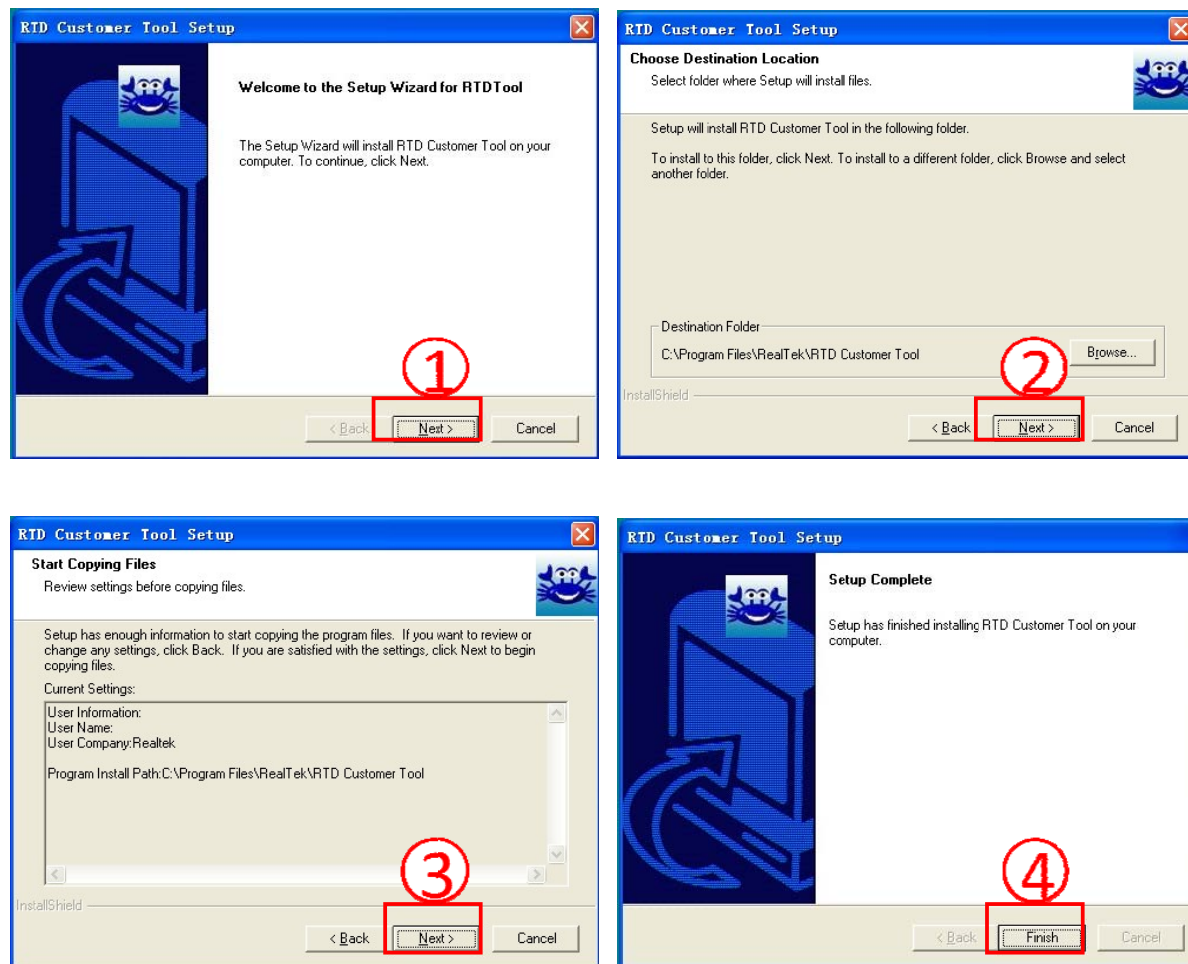Remark: The USB driver files path: D:\FTC100103(Mstar)\FTCUSB.INF

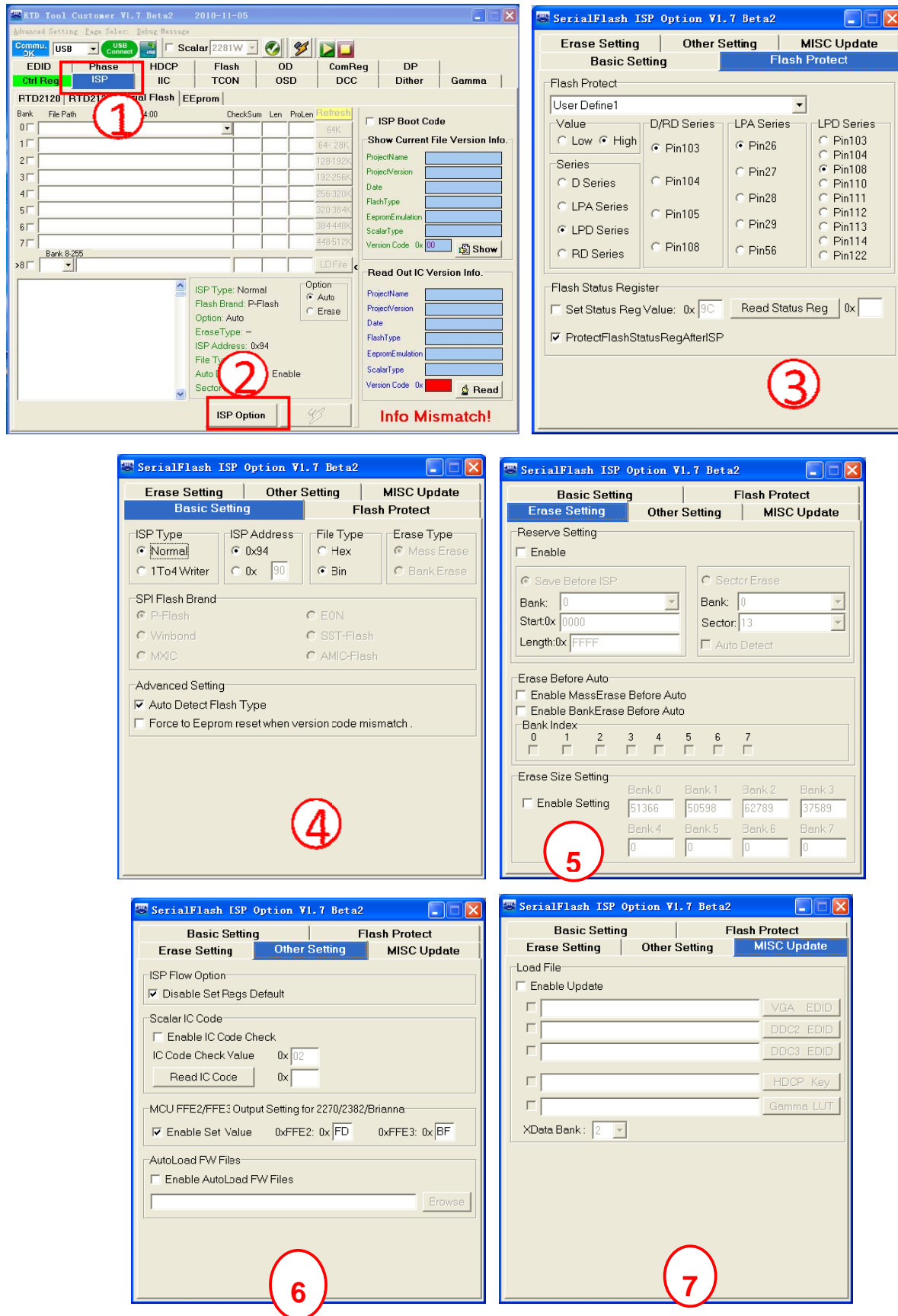Click "Finish" to complete the USB serial port driver installation.

6.4 Install the ISP tool.
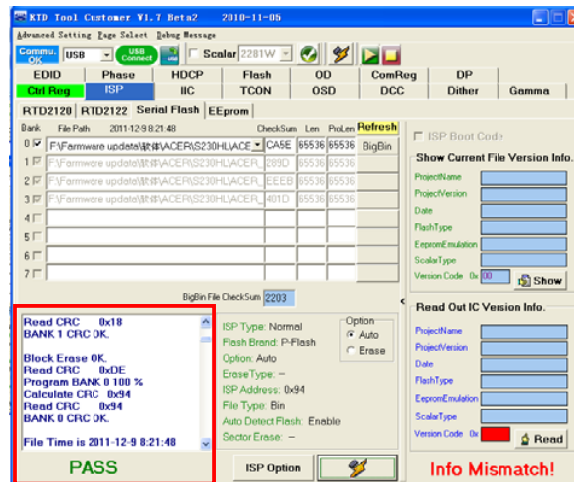
6.4.1 Copy ISP tool in one folder.

6.4.2 Double-click to install the ISP tool.

6.4.3 Double-click to run the ISP tool and complete as the following steps

6.4.5　Load the F/W you want to upgrade.
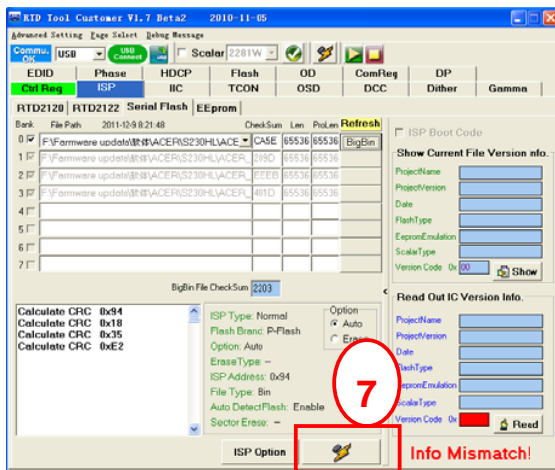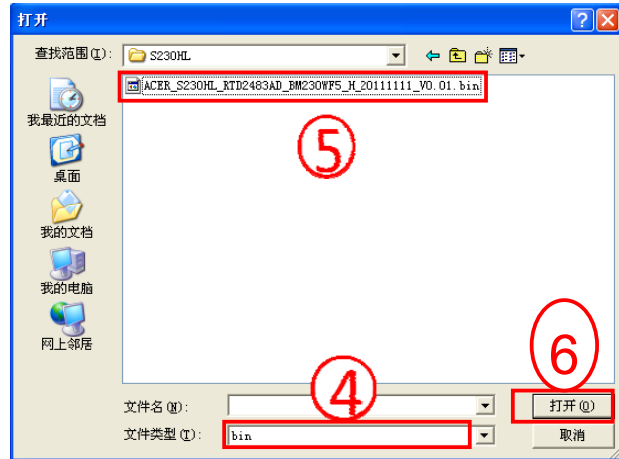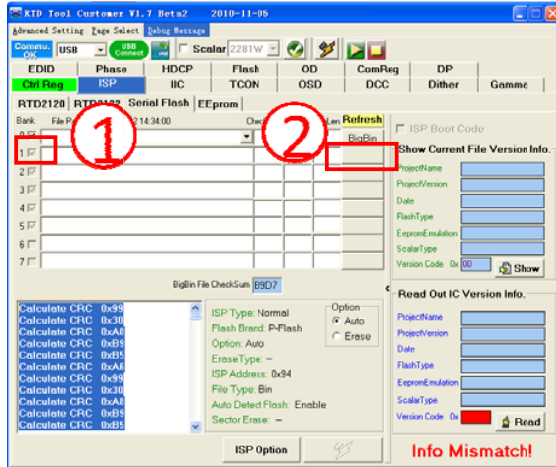
6.5 Check the firmware version.

S1. Connect VGA source to monitor and turn it on.

S2. Pressing "e" and power on, when the screen lights, release the key and press "MENU" again to open the menu with "F" and select "F" to open factory menu.
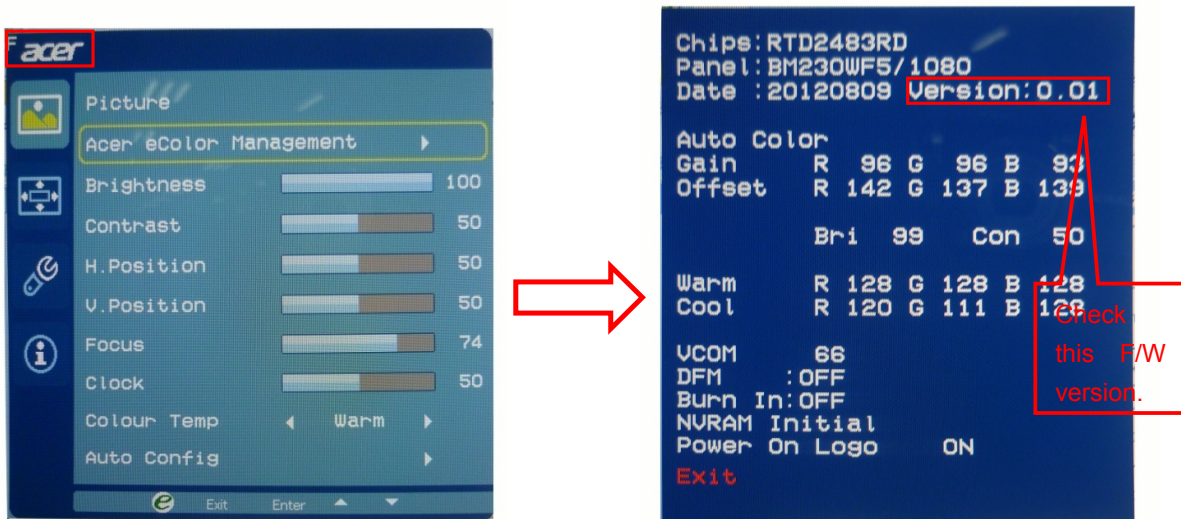
S3. Restart the monitor. And then open the user menu. Factory reset will turn off Burn in mode.
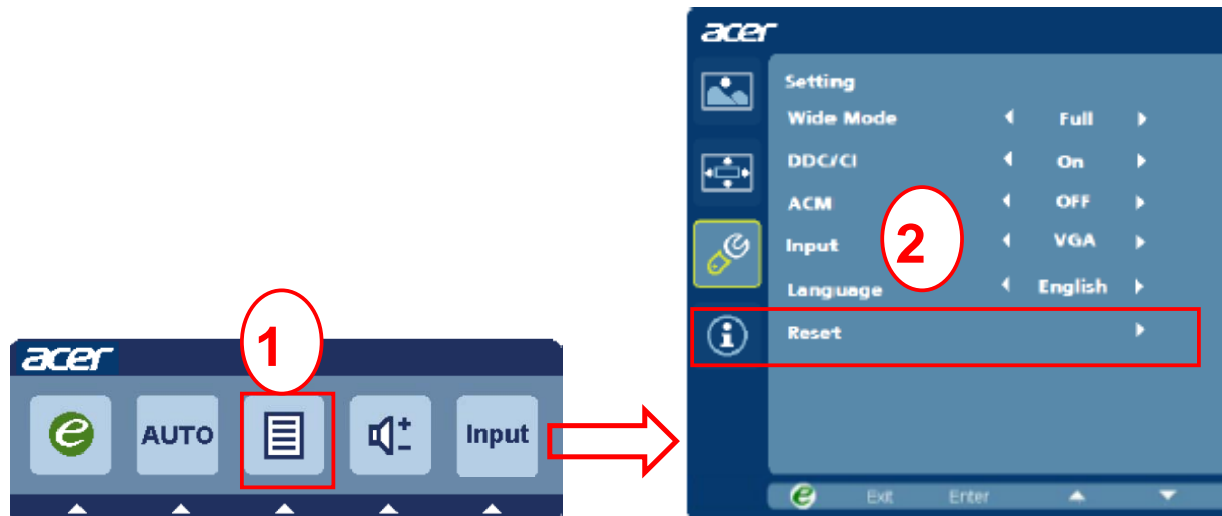
6 . 6   Troubleshooting.

6.6.1   Can't Entry ISP Mode!!
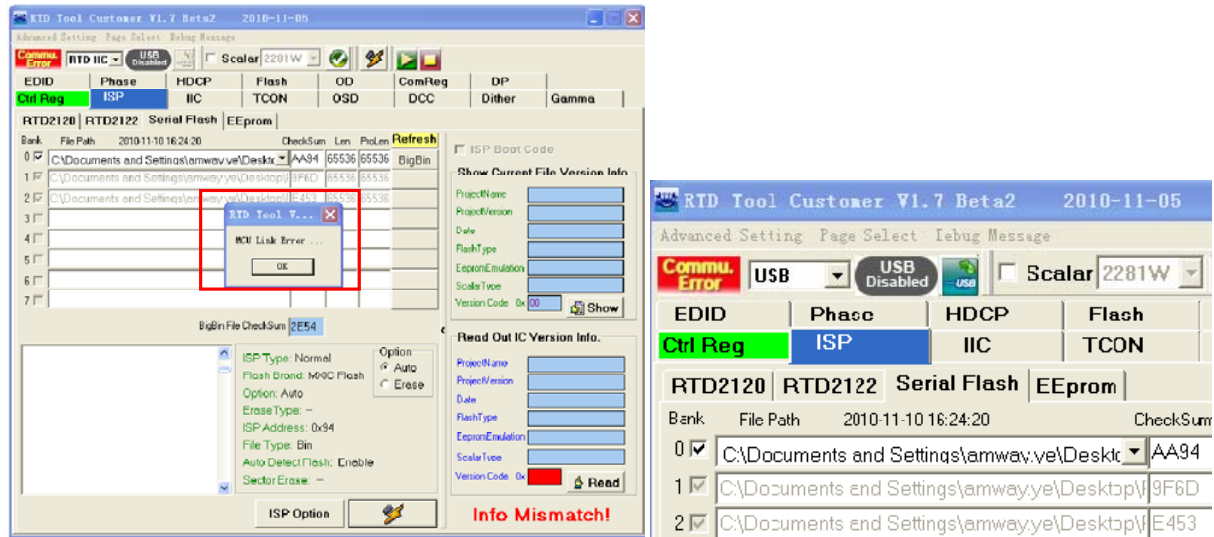
(1) Check the cables and ISP JIG are connected fluently.

(2) Click the usb driver installed correct.

(3) AC off the monitor for a while and retry it.

(4) Change ISP JIG or cable.

(5) Change PC.

7. Writing EDID Process

The SOP as below apply to the model H236HL Analog+DVI+HDMI

7.1 Test Environment Preparation:

Hardware and Software Required:

- LPT cable(male to male)

- VGA cable

-12V DC adapter

- ISP Board: 715GT034-B

- PC

- Monitor

- LPT port driver

- ISP tool: TPVDDC20100901.exe

- EDID

LPT cable(male to male)

VGA cable

12V DC adapter

ISP Board: 715GT034-B

PC
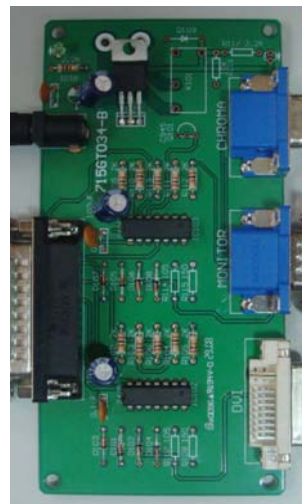
Monitor
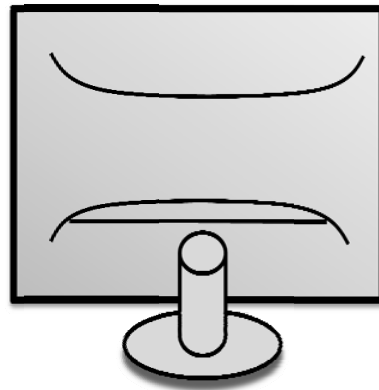
LPT port driver
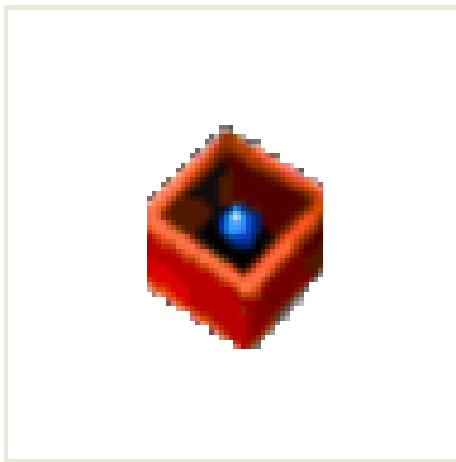
ISP tool: TPVDDC20100901.exe

PORT95NT.EXE

TPVDDC20100901.exe
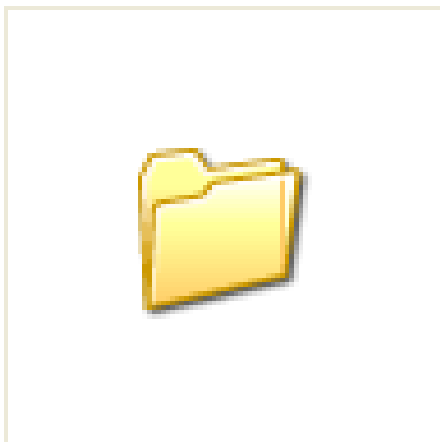
EDID

H236HL

7.2 Connection:
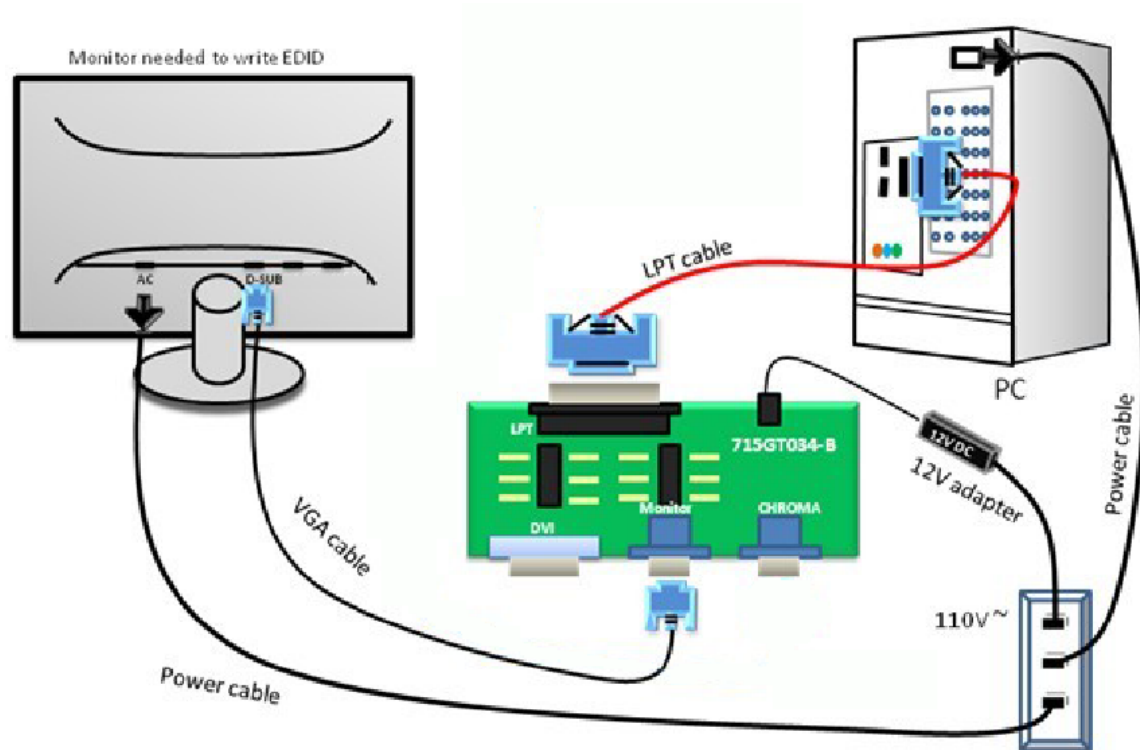
7.3 Writing VGA and HDMI Process:

S1.Double-click **PORT95NT.EXE** PackageForTheWeb Stub InstallShield Software Corpora...to install it. And restart PC after installation.

S2. Prepare the EDID written. Change the EDID files name as below rule.

Anolog EDID ⟶ wA.dat

DVI EDID ⟶ wD.dat

HDMI2 EDID⟶ wH.dat

S3. Copy WA.dat to one folder named as ACER S230WL which must contains "config.ini" file.

S4. Copy ACER S230WL to DDC folder and put DDC and ISP tool together.
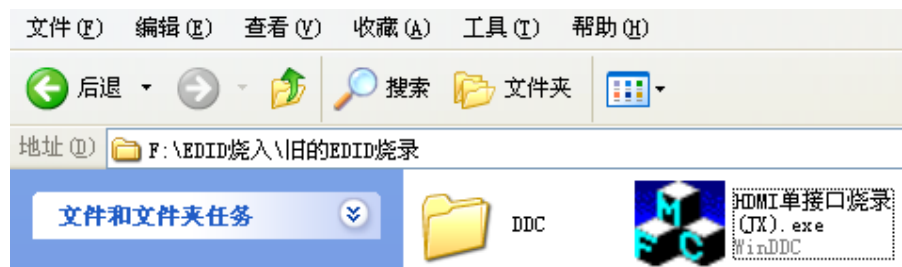
S5. Double-click [icon: HDMI单接口 2011-07-18.exe WinDDC] the icon to open the tool.
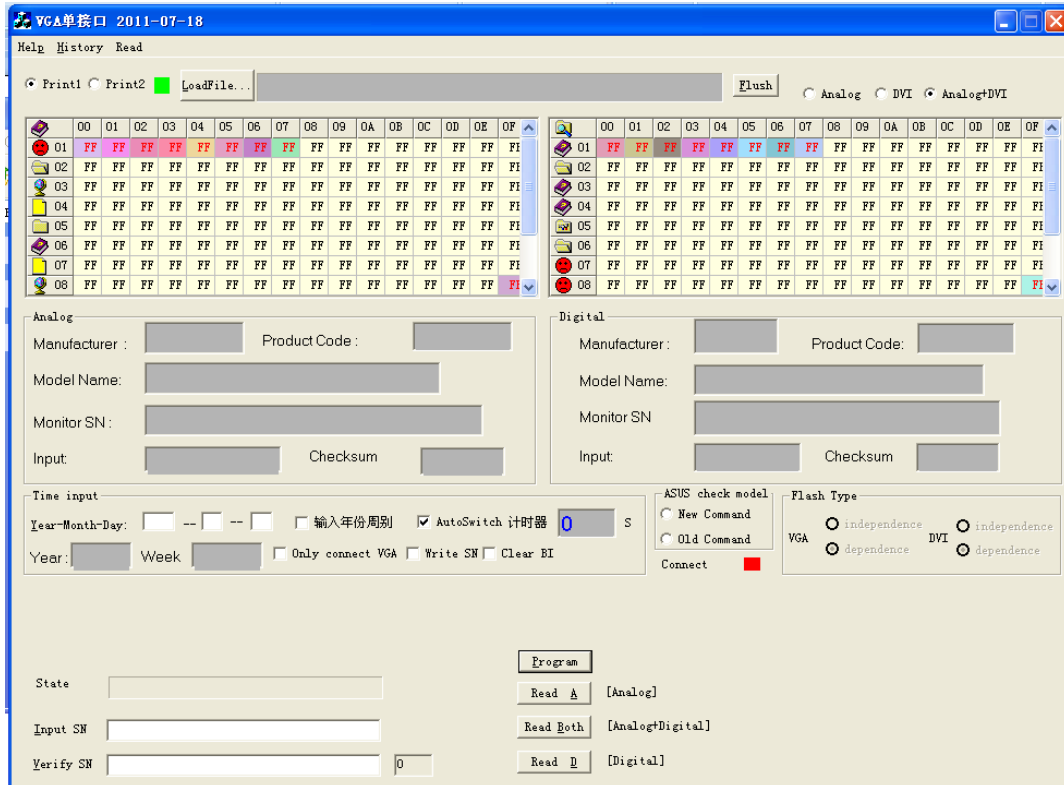
S6. Click "Loadfile" to set the parameters. Click "Analog", "HDMI1" and "HDMI2", Manufacturer: ACR, Product Code: 02D7,Model Name: ACER S230HL.
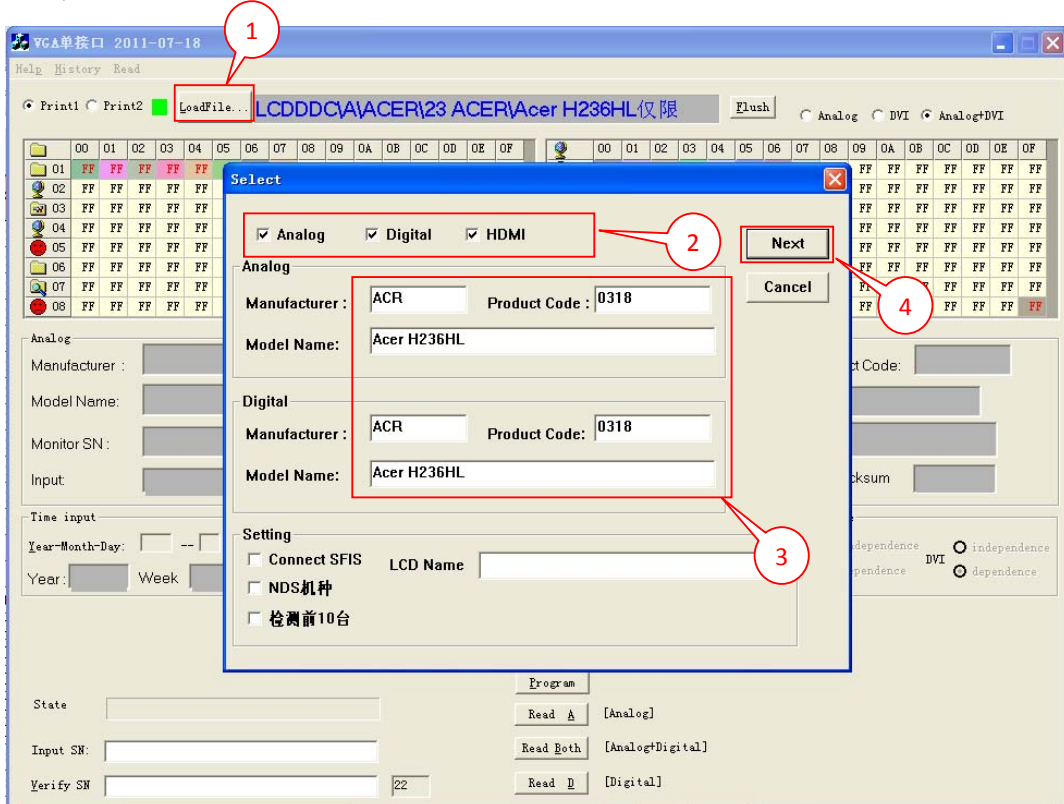
S7. Select the EDID folder as the below picture.
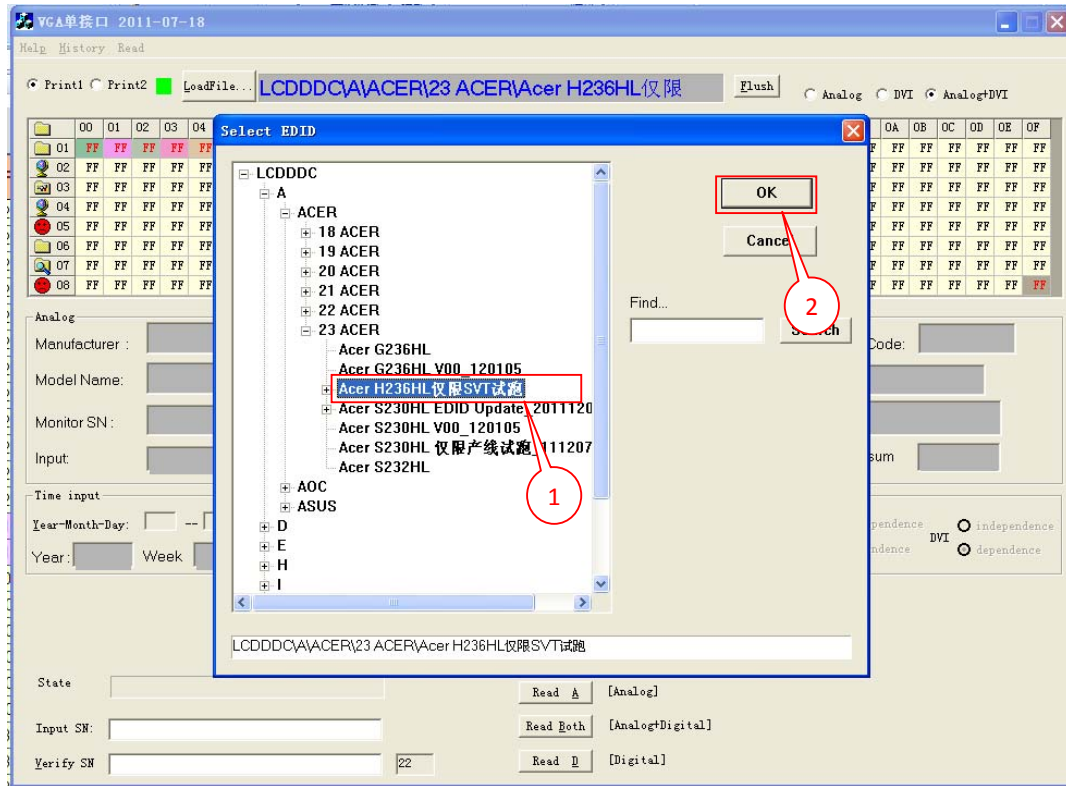
S8. Load EDID successful.
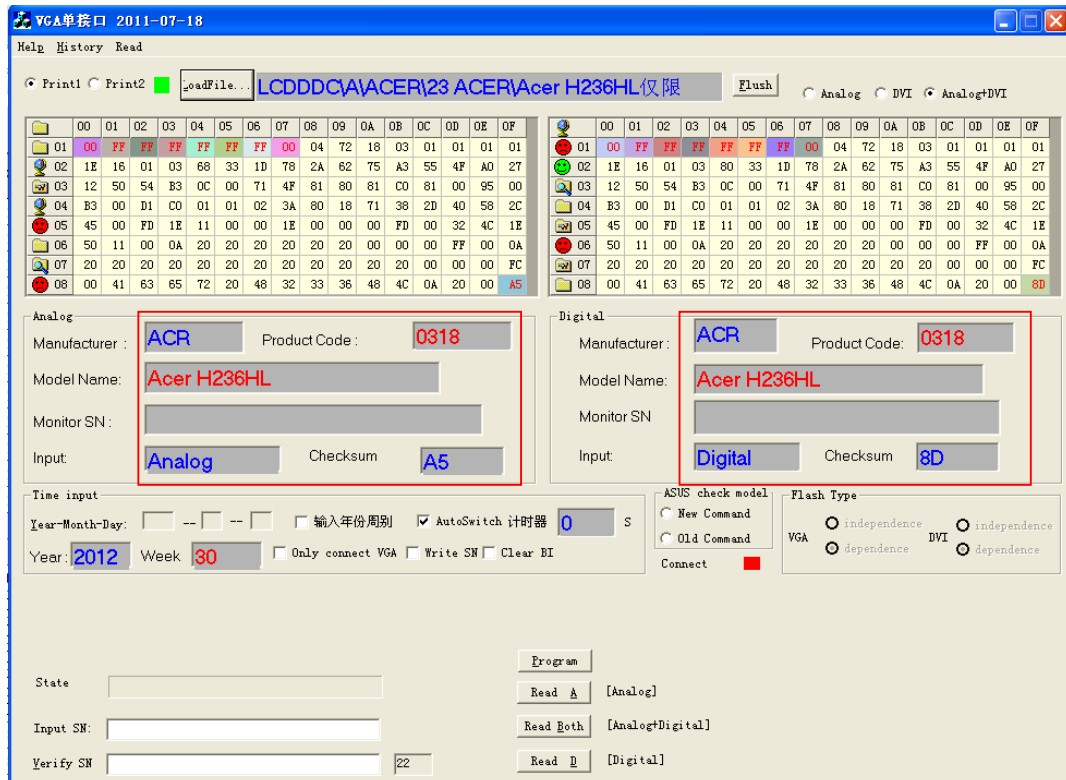
S9. Check the Only connect HDMI" and "Write SN", and type in the 22 digit S/N which must be the same as S/N in the monitor's barcode.
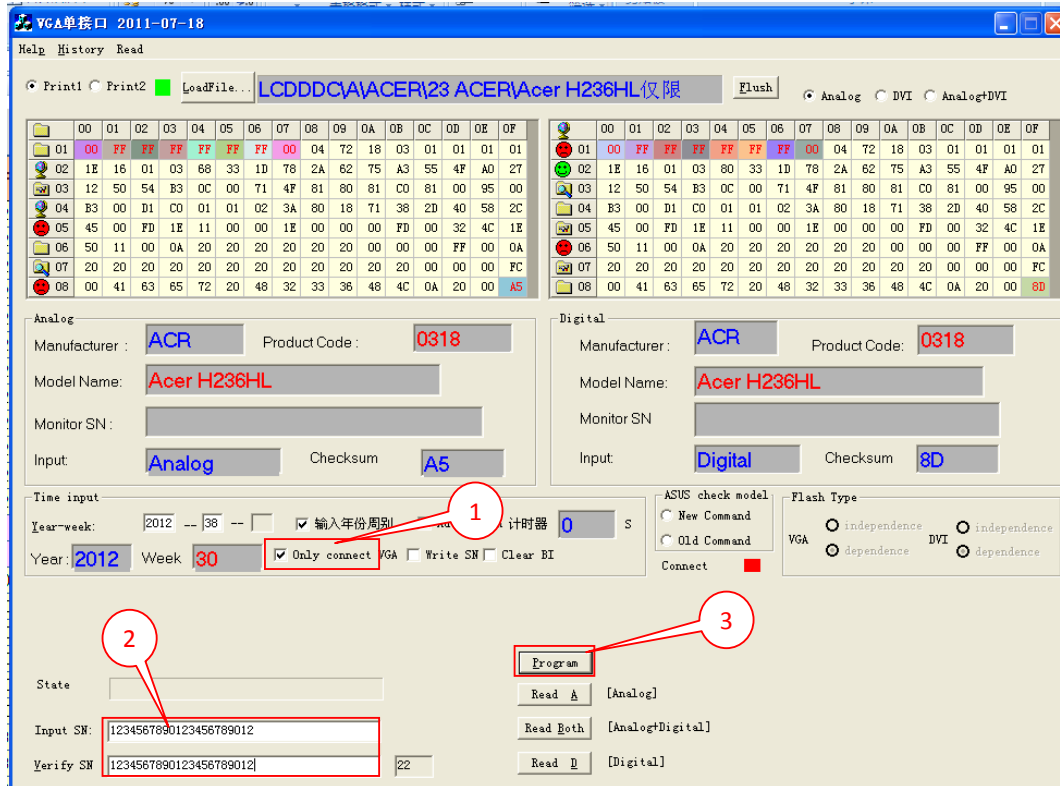
S10. Click "Program" to start writing. When the green "PASS" appear, the process is finished.
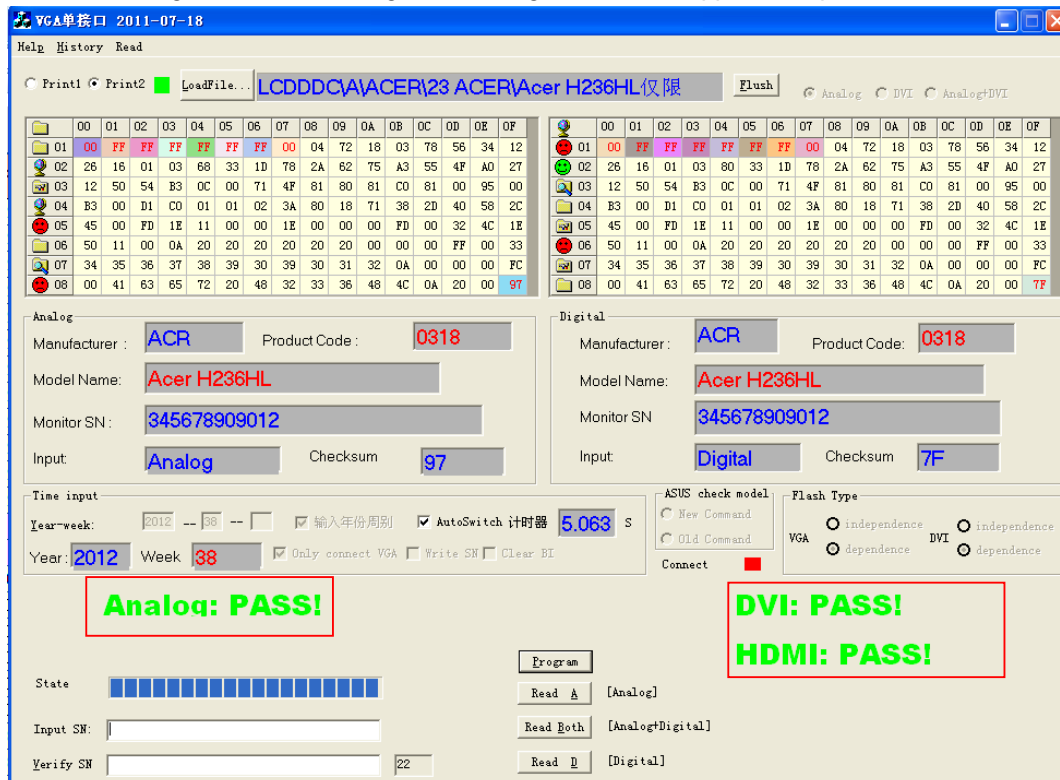
7.4 Check the S/N.

S1. Press "MENU" key —" "— "Information"—"SN" in user mode.
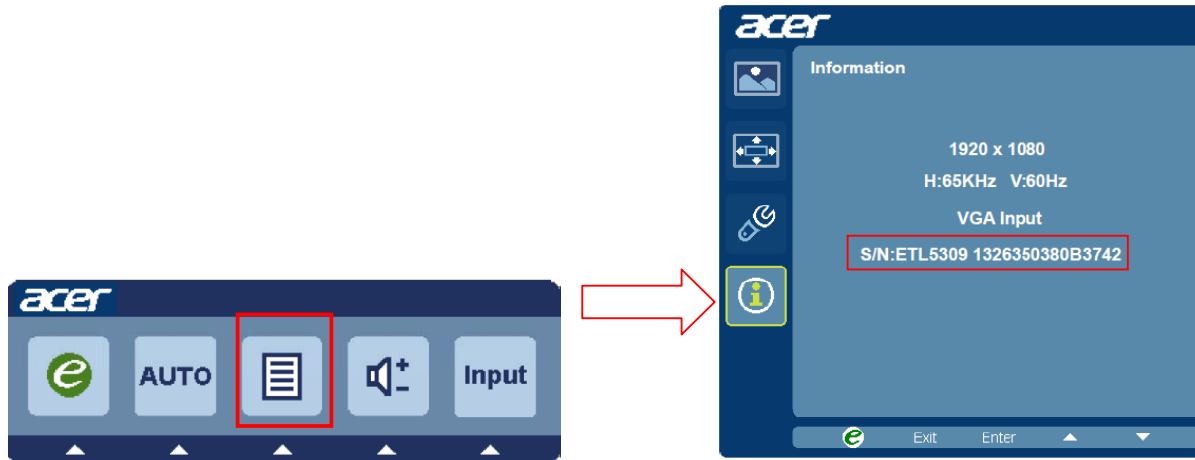
7.5 Q&A

S1. If can't write! You could try to restart the monitor (AC on the monitor and turn on it).

S2. If can't write! Take apart the monitor and connect the 7pin of EEPROM to GND to diable write protection then write EDID one by one.

S3. If can't write! Set the Burn in on last to try again.

8. FRU (Field Replaceable Unit) List

This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of Acer H236HL. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

Please note that WHEN ORDERING FRU PARTS, you should c heck the most up-to-date information available on your regional web or channel. For whatever reasons a part number change is made, it will not be noted on the printed Service Guide. For ACER AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code from those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how to dispose it properly, or follow the rules set by your regional Acer office on how to return it.

Picture	Description	LNT Part No.	Acer Part No.
	bezel	A34G3021AEM-1B0100	42.LX1M2.001
	PANEL LM230WF3-S2E2	750GMT230W3E21N100	KL.2300W.002
	mid-frame ASSEMBLY	705GFACS307	60.LX1M2.005
	KEYPAD BOARD	KEPCCQYO	55.LX1M2.002

	STAND ASSY	705GFACS308	60.LX1M2.002
	CONVERSION G5757-M0B-000-0040-2-120717	CBPCCT7ABQD	55.LX1M2.001
	Mainframe	A15G1793201	33.D2GM2.001
	rearcover	A34G3022AEMA3B0100	60.LX1M2.001
	STAND ASSY	705GFACS308	60.LX1M2.002

9. Schematics and Layouts

9.1 Schematics

Main Board

715G5757M0D000004L

CN201
HDMI

D2+ 1
D2 Shield 2
D2- 3
D1+ 4
D1 Shield 5
D1- 6
D0+ 7
D0 Shield 8
D0- 9
CK+ 10
CK Shield 11
CK- 12
CE Remote 13
NC 14
DDC CLK 15
DDC DATA 16
GND 17
+5V 18
HP DET 19

TH1 20
TH2 21
TH3 22
TH4 23
TH5 24

HD2+   R213 0R05 1/16W   HDMI1_D2+ 6
HD2-   R214 0R05 1/16W   HDMI1_D2- 6
HD1+   R215 0R05 1/16W   HDMI1_D1+ 6
HD1-   R216 0R05 1/16W   HDMI1_D1- 6
HD0+   R217 0R05 1/16W   HDMI1_D0+ 6
HD0-   R218 0R05 1/16W   HDMI1_D0- 6
HCK+   R219 0R05 1/16W   HDMI1_CK+ 6
HCK-   R220 0R05 1/16W   HDMI1_CK- 6

DET_HDMI

HDMI_SCL
HDMI_SDA

HDMI1_+5V   R201 1K 1/16W 5%   HDMI1_+5V

HDMI_HOTPLUG   R202 10R 1/16W 5%   PB1*   HDMI1_HPD 6

C201 100N16V   ZD203 Q202 NC NC/RLZ5.6B   R212 NC

HDMI1_+5V
R208 10K 1/16W 5%
DET_HDMI   R210 0R05 1/16W   DET_HDMI1 6
Q201 LMBT3904LT1G
R209 10K 1/16W 5%

HDMI1_+5V   +5V
ZD201 NC/RLZ5.6B   D201 BAT54C   +5V   3,4,6,8,9
ESD_HDMI1
C202 220N16V

U203
NC CH1 10   HD0-
NC CH2 9   HD0+
VN 8   HD1-
NC CH3 7   HD1+
NC CH4 6
AOZ8804DI

U202
I/O1 I/O4
GND NC
I/O2 I/O3
AZC398-04S
HDMI_HOTPLUG
DET_HDMI
HDMI_SCL
HDMI_SDA
C203 100N16V

2K7 1/16W 5%   2K7 1/16W 5%   22K 1/16W 5%
R203 R204 R205

U204
NC CH1 10   HD2-
NC CH2 9   HD2+
VN 8   HCK+
NC CH3 7   HCK-
NC CH4 6
AOZ8804DI

HDMI_SCL   R206 47R 1/16W 5%
HDMI_SDA   R207 47R 1/16W 5%

U201
VCC A0
WP A1
SCL A2
SDA GND
AT24C02C-SSHM-T

6 HDMI1_SDA
6 HDMI1_SCL
EDID_WP 6

	E2251S	E2251T	E2251V	E2051S	E2051T	E1951S	E1951T
Audio	NC	NC	Yes	NC	NC	NC	NC
DVI	NC	Yes	Yes	NC	NC	NC	NC
HDMI	NC	NC	Yes	NC	NC	NC	NC
Scaler IC	RTD2281W	RTD2281W	RTD248XED	RTD2271W	RTD2271W	RTD2271W	RTD2271W
1.2V LDO	NC	NC	Yes	NC	NC	NC	NC
LVDS	CN406	CN406	CN406	CN406	CN406	CN407	CN407

NC/RTD2483XD-CG
U401 U411 RTD2271CW-CG

For H236

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	LGE E51	Size	B
715G4951-M0D-000-0040-1_110330	TPV MODEL	LGE E2351VR	Rev	D
Key Component	HDMI	PCB NAME	715G4951-M0D-000-0040-1	
Date	Friday, August 03, 2012	Sheet	5 of 10	

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	LGE E51	Size	Custom
715G4951-M0D-000-0040-1_110330	TPV MODEL	LGE E2351VR	Rev	D
Key Component	SCALER	PCB NAME	715G4951-M0D-000-0040-1	
Date	Friday, August 03, 2012	Sheet	6 of 10	

PA[0..9] PA[0..9] 6 PB[0..9] PB[0..9]

PA0	LVA3P
PA1	LVA3M
PA2	LVACKP
PA3	LVACKM
PA4	LVA2P
PA5	LVA2M
PA6	LVA1P
PA7	LVA1M
PA8	LVA0P
PA9	LVA0M

PB0	LVB3P
PB1	LVB3M
PB2	LVBCKP
PB3	LVBCKM
PB4	LVB2P
PB5	LVB2M
PB6	LVB1P
PB7	LVB1M
PB8	LVB0P
PB9	LVB0M

CONN

LVB0M	RXO0-	30
LVB0P	RXO0+	29
LVB1M	RXO1-	28
LVB1P	RXO1+	27
LVB2M	RXO2-	26
LVB2P	RXO2+	25
		24
LVBCKM	RXOC-	23
LVBCKP	RXOC+	22
LVB3M	RXO3-	21
LVB3P	RXO3+	20
LVA0M	RXE0-	19
LVA0P	RXE0+	18
		17
LVA1M	RXE1-	16
LVA1P	RXE1+	15
		14
LVA2M	RXE2-	13
LVA2P	RXE2+	12
LVACKM	RXEC-	11
LVACKP	RXEC+	10
LVA3M	RXE3-	9
LVA3P	RXE3+	8
		7
		6
		5
	X	4
		3
		2
		1

CN406

CN407

RXO0-	29	30	
RXO1-	27	28	
	25	26	RXO0+
RXO2-	23	24	RXO1+
RXOC-	21	22	RXO2+
RXO3-	19	20	RXOC+
RXE0-	17	18	RXO3+
RXE1-	15	16	RXE0+
RXE2-	13	14	RXE1+
RXEC-	11	12	RXE2+
RXE3-	9	10	RXEC+
L/T_SDA	7	8	RXE3+
	5	6	L/T_SCL
	3	4	
	1	2	

NC/CONN

VLCD

VLCD 8

FB102 120R 6A

C141 100uF/16V
R146 300 OHM 1/4W
R147 300 OHM 1/4W
C142 100N16V

L/T_SDA
L/T_SCL
L/T_SDA 6
L/T_SCL 6

RXEC-   C143 NC   RXEC+
RXOC-   C144 NC   RXOC+

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	LGE E51	Size	A
715G4951-M0D-000-0040-1_110330	TPV MODEL	LGE E2351VR	Rev	D
Key Component	LVDS PANEL I/O	PCB NAME	715G4951-M0D-000-0040-1	称爹	<称爹>
Date	Friday, August 03, 2012	Sheet	7 of 10		

modify for 19V

+5V +5V
R702 10K 1/16W 5%
R703 10K 1/16W 5%
BKLT_EN BKLT_EN 9
C702 100N16V
Q701 LMBT3904LT1G
R704 22K 1/16W 5%
on_BACKLIGHT 6

+5V
R705 22K 1/16W 5%
BKLT_VBR1 9 BKLT_VBR1
R706 100R 1/16W 5%
Adj_BACKLIGHT 6

U702 G960PT43U
SOT 23-3
VIN VOUT GND
VCC3.3
SOT 223
U701 NCP1117-33/3.3UF
VI VO GND
VCC3.3 6
+5V
D702 SR34
C708 100N16V
C709 100N16V
C707 22uF 10V
C706 NC/22uF 10V

VLCD VLCD 7
+5V
R719 10K 1/16W 5%
R721 100K
Q705 AO3401A
Q704 NC/AO4449 -7A-30V
Panel_ON 6
R720 22K
Q706 LMBT3904LT1G
R722 NC
C724
C725 100N16V
+5V
R718 4K7 1/16W 5%
C723 220N16V

EMI
120OHM
FB702 +5V
+5V 3,4,5,6,9

C728 1uF 25V
U705 APW7089KAI-TRG
VCC EN FB GND VIN COMP
L701 22UH
D701 SR34
R713 NC
R715 53.6KOHM +-1% 1/10W
C714 100pF 50V
R712 150K 1/16W 5%
R711 33K 1/16W 5%
C712 100N 50V
C721 100N16V
C720 10uF 25V
C713 1uF 25V
R726 30Kohm 1/16W +-5%
C731 22pF 50V
C722 2N2 50V
R714 10K +-1% 1/10W
C710 NC
C723 10uF 25V
C716 470uF 10V
C717 100N16V
ZD702 NC/RLZ6.2B
C701 100N 50V
EMI

+19V +19V 9,10
FB701 BEAD
C732 10uF 25V
C718 100UF 35V
C715 1N 50V
C719 100N 50V
C733 100UF 35V
CN701
JACK

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	LGE E51	Size	C
715G4951-M0D-000-0040-1_110330	TPV MODEL	LGE E2351VR	Rev	D
Key Component	POWER	PCB NAME		称爹	<称爹>
Date	Friday, August 03, 2012	Sheet	8 of 10		

+19V

2011/ 9/ 28

EMI

Base on 23 " setting

PWM to Analog 稻

+19V

EMI

R/A type

Key Board

715G5673K01000004Q

LBADC1.	MENU	1.1 V
	VOL- (GND)	0 V
LBADC2	VOL+	1.1 V
	AUTO	0.65 V
	ECOLOR(GND)	0 V

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	Acer S236HL keypad	Size	A4
纸隔瓜網腹	TPV MODEL	acer	Rev	A
Key Component	02.KEY	PCB NAME		称爹	<称爹>
Date	Monday, May 14, 2012	Sheet	2 of 2	

9.2 Layouts

Main Board

715G5757M0D000004L

Key Board

715G5673K01000004Q